

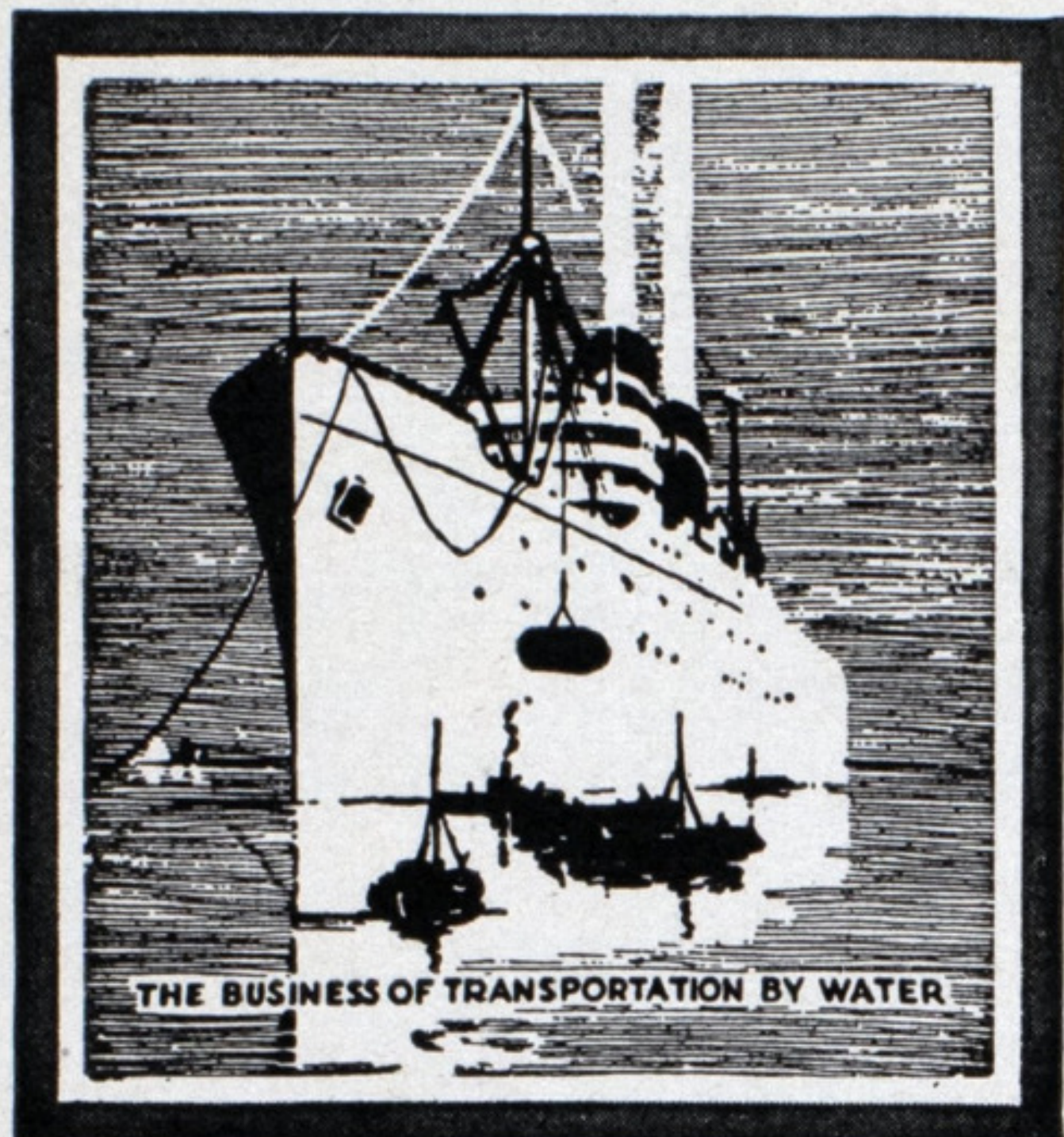
# Marine Review

*The National Publication Covering the Business of  
Transportation by Water*

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# « EDITORIAL »

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## A Favorable Shipping Policy is a National Asset

ONE of the two leading parties of the nation, in convention assembled, has nominated its candidates for president and vice president and has adopted a platform of policy. Every one interested in the shipping industry is particularly concerned with its statement in regard to national defense and the merchant marine. The platform states that a policy of continued earnest efforts toward further disarmament, as indicated by present participation in the Geneva conference, will be pursued. To this, there can be no objection. It is equally important, however, that in the meanwhile, as the platform states, maintenance of our navy on the basis of parity with any nation be adhered to with resolution and that the declaration, "we do not propose to reduce our navy defenses below that of any other nation," shall be put into effect not alone in a program and on paper, but in ships.

The party is committed to the co-ordination of transportation by rail, highway, air and water and to the proposition that all these means of transportation should be subjected to appropriate and constructive regulation. Allowing a fair and wise approach to the solution of the problem of such regulation, it is undoubtedly a move in the right direction. It seems only just that all these means of transportation should, "operate under conditions of equality." That the condition of equality referred to is a highly debatable subject goes without saying and will require not only much careful and unbiased investigation but judgment of the highest order.

The platform reiterates the established policy of the party, "to encourage the further development of the merchant marine under American registry and ownership," and as an earnest of this policy it points out, with justice we think, that under the present administration, the American merchant fleet has been enlarged and strengthened. In view of this expressed policy it is difficult to take seriously the suggestion

which has been made in the senate that no further loans for ship construction purposes be made and that mail contracts, entered into in good faith by the government for a period of ten years with private owners, be abrogated.

A strong merchant marine is in no sense of the word a class interest. It benefits the whole nation. Undoubtedly the other major party will also favor a continued aggressive policy of developing the merchant marine. In spite of propaganda from sources unfriendly to the strengthening of our merchant marine the fact remains that the merchant marine act of 1928 has functioned in a very business-like manner to the end that we already have a considerable fleet of fine modern merchant ships in service and more under way. This policy should be actively continued so that every vital trade route in which we are interested will be adequately protected by first-class American ships.

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## Employment Service is Strengthened

BY AFFILIATION with the engineering societies employment service the Society of Naval Architects & Marine Engineers has made available for the use of its members the facilities of the employment service maintained by the principal national engineering societies.

Registration forms for this service have been distributed to the members of the society and members are urged to fill these out and file them with the service even though they may not be looking for a position, as registration will enable the service to call the members' attention to opportunities for serving as a consultant or in other capacities that might require the member's special qualifications.

There are a number of members of the society now unemployed and others whose present connections will soon be terminated. It is particularly important that these individuals fill out and mail the forms mentioned to the secretary of the society at once. If the forms have been lost, notify the secretary to this effect, at the same time giving an outline of training and experience, as well as personal information that would be helpful in classifying applications. By doing this, valuable time will be



saved in assisting members to find suitable connections. Unless this information is brought to the attention of the society it will obviously be impossible for the employment service to function in their behalf.

Members connected with concerns which are employers in the shipbuilding, ship operating or allied supply field are especially urged to cooperate with this engineering employment service so that when vacancies occur in their organizations satisfactory candidates may be made available for such openings. Through the National Council of American Shipbuilders and the American Steamship Owners' association the first two groups will have been officially notified of the service, and their support solicited. The third group, that of the allied industries, supplying materials and equipment to ships, is more difficult to reach. An earnest request is therefore made to companies within this class that they notify the society at once of such openings as may require the services of highly qualified engineers, draftsmen, salesmen and the like.

Since 1923 the engineering societies employment service has placed a total of 10,356 individuals. Even in the present period of low employment demand about 700 positions were filled in 1931 through its efforts.

As a special aid to those who apply to the society for this service a weekly bulletin listing positions to be applied for by letter will be available.

It is the sole aim of the officers of the Society of Naval Architects & Marine Engineers during this trying period to serve the membership in the most practical way possible. It remains for possible employers to cooperate to the fullest extent by notifying the society of openings in their organizations. Members who are unemployed or about to come within this category should avail themselves of the employment service provided.

All communications should be addressed to the secretary of the Society of Naval Architects & Marine Engineers, 29 West Thirty-ninth street, New York city.

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## On Scrapping Obsolescent Ships

MUCH is heard of obsolescence. The average shipping man under present conditions with diminishing cargoes and passenger travel is probably fairly tired of hearing about it. His question might well be—what about it, what can I do? In the face of not having employment for existing ships, how

can I scrap my older ships and build new ones? This is all true but it does not do away with the fact that there are at present many obsolescent units and something will have to be done about it sooner or later.

That this question is receiving serious attention from the shipping men of Great Britain is evidenced by a communication on this subject from the chamber of shipping of the United Kingdom to the chancellor of the exchequer urging a concession on account of obsolescence where a ship is sold for scrap purposes but not replaced immediately. It is pointed out that the present economic condition of the British shipping industry is so serious that it is of the utmost importance to remove any factors tending to keep in commission tonnage which ought to be scrapped.

Attention is called to the fact that the supply of world tonnage is now 50 per cent in excess of the prewar supply and that the volume of world trade and, therefore, of demand, has shrunk to something definitely below prewar proportions. From this the conclusion is drawn that the supply of existing tonnage is at least 50 per cent in excess of demand. As a result of this condition shipping is making no profits and the possibility of earning a profit is so remote that it is impossible for shipowners to place orders for new ships even though it is recognized that modern ships are much more economical than existing tonnage.

It is therefore suggested that, since present obsolescence allowances are conditional upon replacement but replacement being out of the question, the industry is confronted with a paradoxical situation in which, at a time when obsolescence is at its peak, obsolescence allowances has largely disappeared. The chamber therefore feels that all deterrent factors in putting tonnage definitely out of commission and scrapping it at the earliest possible moment should be removed.

For this purpose the chamber suggests that provision should be made for allowing owners of any tonnage which is scrapped before it has been fully written off to bring into debit in their current accounts and to carry forward to the debit of their future accounts the difference between the book value and the realized break-up value.

This surely indicates the existence of and the menace to the future welfare of the industry of a do-nothing policy in regard to obsolescent units. A similar policy would be just as beneficial to the American merchant marine as it is evident British shipping men feel that it is in their case.



## Cruiser Portland Launched

A new cruiser for the United States navy, the PORTLAND of 10,000 tons was launched at the Fore River plant of the Bethlehem Shipbuilding Corp. on May 21.

She is 610 feet 3 inches long, 66 feet 1 inch in beam and 36 feet deep. She has four propellers driven by turbine reduction geared machinery of a total shaft horsepower of 107,000. Her designed speed is 32½ knots. She

will carry nine 8-inch guns, eight 5-inch guns and eight anti-air craft machine guns. Accommodation in a protected space will be provided for two airplanes. Catapults are installed.

Contract for the construction was awarded on Aug. 15, 1929; keel was laid Feb. 17, 1930. Her completion is expected in December, 1932. The sponsor at the launching was Miss Mary Elizabeth Brooks, 12-year old daughter of Ralph D. Brooks, chairman of the city council of Portland, Me.

## A. Melville Dollar Dies

After attending his father's funeral A. Melville Dollar, eldest son of the late Capt. Robert Dollar, returned to his home in Vancouver, B. C. where he died suddenly of heart disease on May 31. He was 59 years old and leaves a widow and seven children. He had not been connected with his father's shipping enterprises, in which his two brothers R. Stanley Dollar and J. Harold Dollar are active, since 1922.

# Santa Paula, Second Grace Liner Launched

**S**ANTA PAULA, second of four sister ships building at the Federal Shipbuilding & Dry Dock Co., Kearny, N. J., for the Panama Mail service of the Grace line, was successfully launched at 2:00 p. m. June 11, sponsored by Mrs. Edward T. Ford of San Francisco, wife of the president of the Panama Mail service of the Grace line.

A unique feature of the launching was a colorful pageant of clipper ship days which preceded the christening ceremonies. Brief addresses were made by L. S. Rowe, director general of the Pan American union and Representative Arthur M. Free of California, representing the congressional district in which the city of Santa Paula is located. The christening

bottle of California carbonated orange juice was brought across the country by Miss Carolyn Cummings.

At the time of the launching of the SANTA PAULA, her sister ship, the SANTA ROSA, launched on March 24, was lying at her outfitting berth and the third and four sister ships, the SANTA LUCIA and SANTA ELENA under construction, on adjoining ways.

These four magnificent sister ships, costing a total of over \$19,000,000, are to operate between the East and West coasts of United States via the Panama canal touching enroute at Central American and Colombian ports. They were designed by and are being built under the supervision of the New York naval architects, Gibbs & Cox.

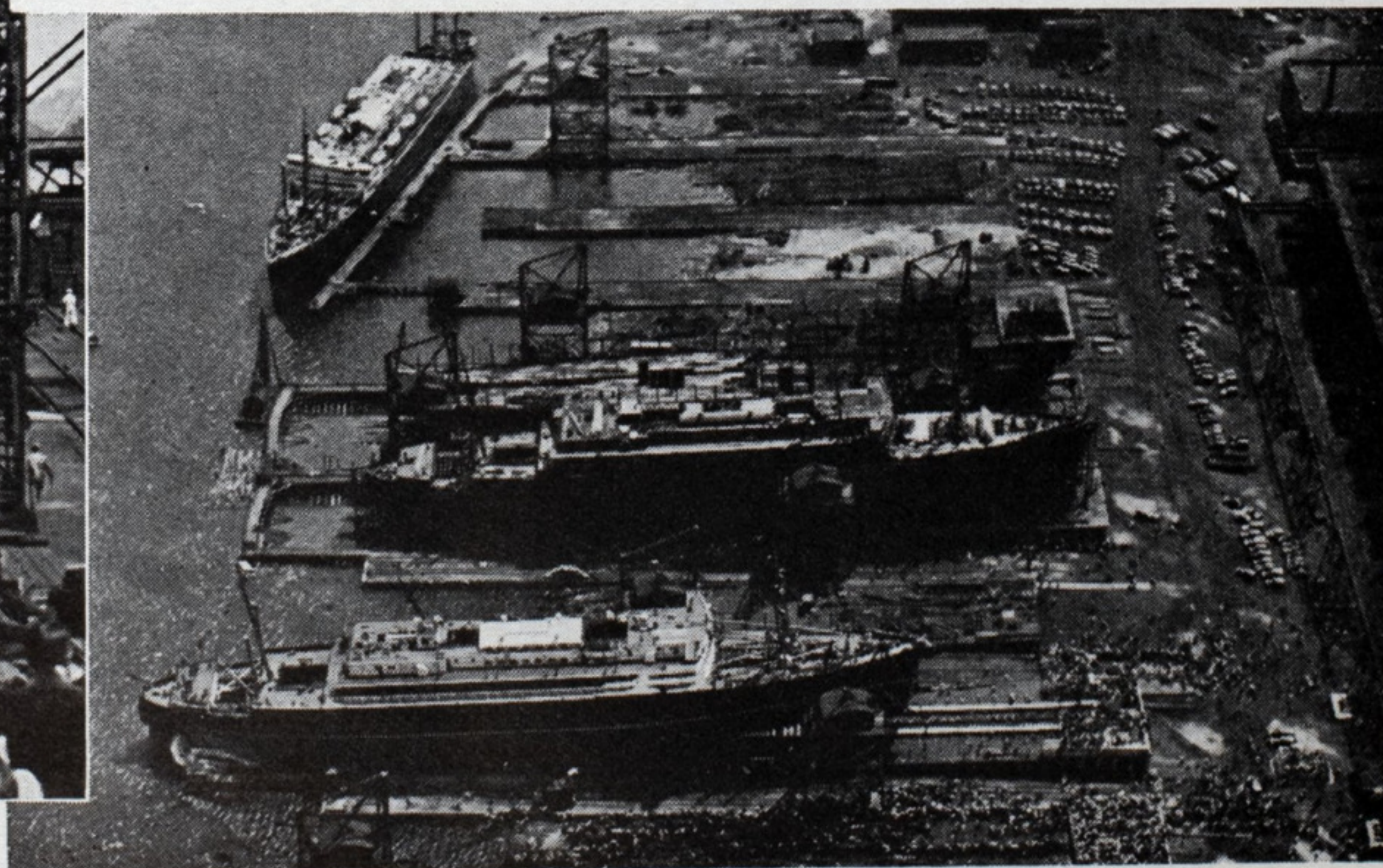
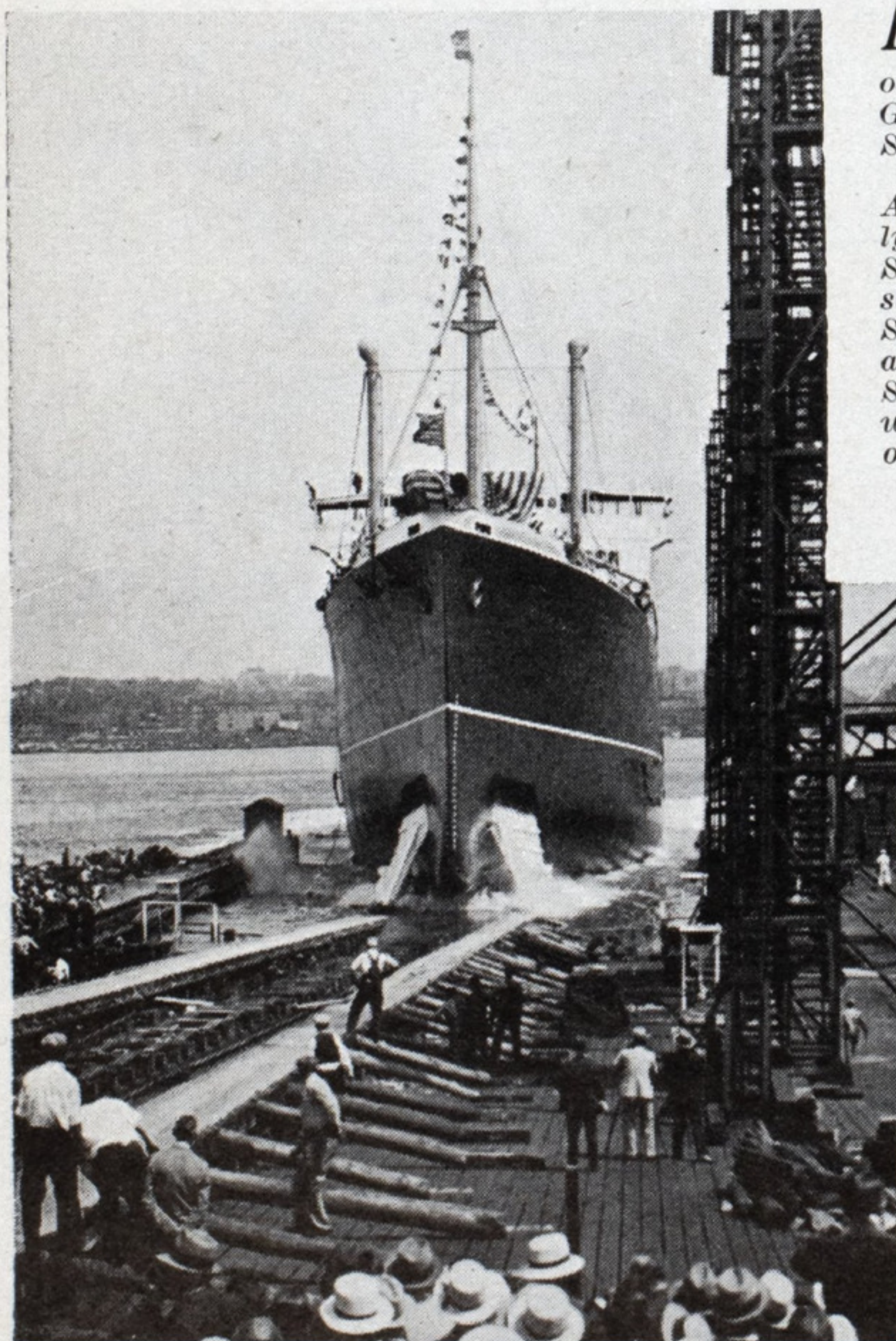
The first of the four new sister ships, the SANTA ROSA, it is expected will enter the Grace line's New York-Panama-Central American-California service on Nov. 26. Her sister ships will follow at intervals of six weeks. With their great speed they will materially cut down the running time of the Grace line's round-the-coast cruises.

The SANTA PAULA and class are the first American ships in which every cabin has its private bath and all are outside rooms. There are several innovations. The dining saloon is two decks high with long French windows opening on the promenade deck and has a specially constructed dome that rolls back transforming the room into an attractive out-door cafe. The veranda club with balcony overlooking the swimming pool and sports deck has a splendid hardwood dance floor as well as tables for refreshments and bridge. The built-in tiled swimming pool with its artificial beach is the largest open-air pool on any ship.

These four liners, built under the provisions of the Jones-White merchant marine act of 1928, are 508 feet in length over all; 72 feet in beam; 39 feet in depth; 10,500 gross tons; and displacement, 17,000.

**L**AUNCHING June 11, of liner Santa Paula, second of four sister ships for the Grace line, at the Federal Shipbuilding & Dry Dock Co., Kearny, N. J.

At left, the Santa Paula nearly water borne. Below, the Santa Paula in the foreground sliding down the ways; the Santa Rosa in the background at the outfitting dock; the Santa Lucia, on an adjoining ways; and construction begun on the Santa Elena on the farther ways





# United Fruit Liners Entering Service

## Twin Screw, Electric, Passenger And Cargo

**T**WO new ships have recently joined the famous great white fleet of the United Fruit Co.; one, the ANTIGUA, is now in service on the Pacific coast; the other, the QUIRIGUA, has just taken her place on the east coast run from New York. These vessels are the first two of the trio of sisterships built to the order of the United Mail Steamship Co. by the Fore River plant of the Bethlehem Shipbuilding Corp., Ltd., Quincy, Mass. The third ship, named VERAGUA, is now nearing completion at that plant, having been launched on April 23;

she is expected to be ready for service about Aug. 1.

These ships were built under the provisions of the Jones-White act, and comply with the requirements of the United States shipping board for government loans, and also with the requirements of the 1929 convention for the safety of life at sea. They are built to the highest class of the American Bureau of Shipping.

The design of these ships was developed by the builder in collaboration with the owner. Considerable effort was expended to determine the

hull form which would best fulfill the requirements of economy and speed, and the very good performances of the vessels on trial indicate that the effort was fully justified.

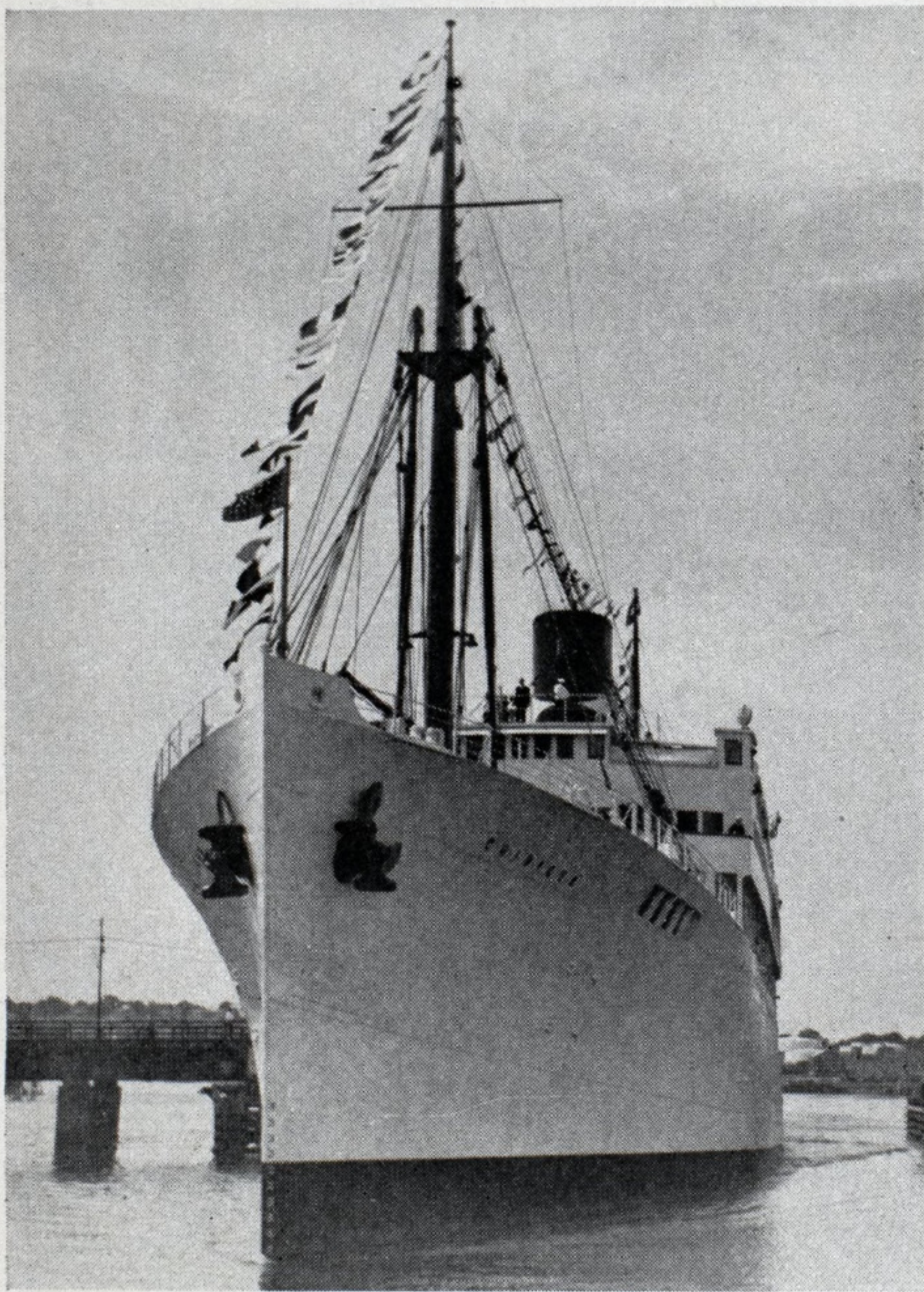
Particulars of the two ships are noted in the table on the next page.

Both ships ran very satisfactory trials on the measured mile off Provincetown, Mass. The ANTIGUA made her runs on March 26, previous to drydocking and final underbody painting. This ship easily developed the guaranteed shaft horsepower of 10,500 and made a speed of better than 19 knots.

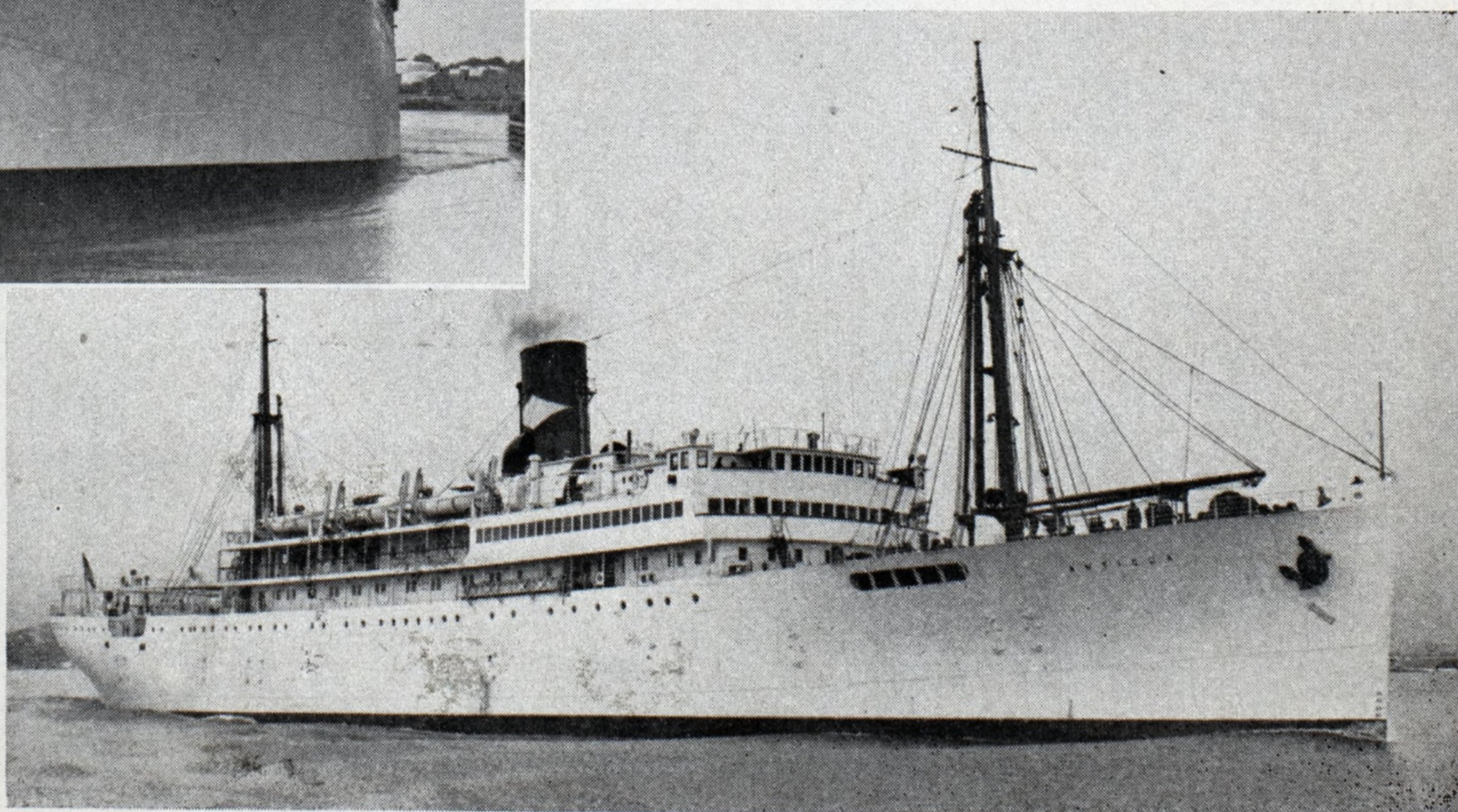
The QUIRIGUA ran her trials on May 28, after leaving drydock. A progressive speed trial was run on this ship; the mean of the three high speed runs was 19.23 knots at 126.4 revolutions per minute and 10,715 shaft horsepower. The high single run was at the rate of 20.36 knots at 126.8 revolutions and 10,890 shaft horsepower.

Fuel consumption on the ANTIGUA, measured on a four hour full power run, was found to be .743 pound per shaft horsepower hour, based on 10,530 shaft horsepower and total oil consumed for all purposes. A similar measurement on the QUIRIGUA, gave a fuel rate of .739 pound per shaft horsepower hour, on the same basis. In each case, fuel oil was corrected to 18,500 B.t.u. per pound.

Since both ships are alike in practically all details, the following description, written as for the ANTIGUA will be understood to apply to the QUIRIGUA as well.

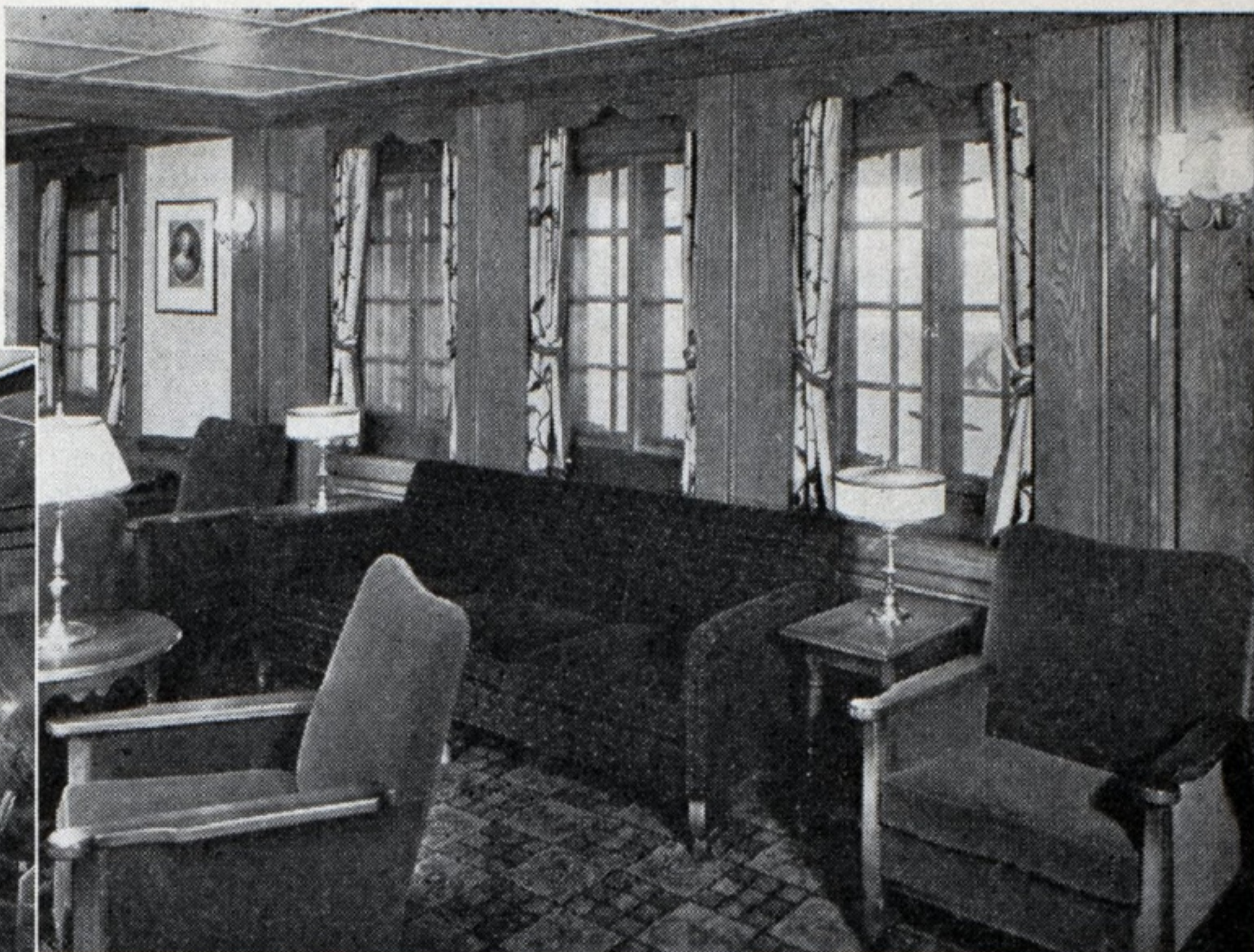


*Two new passenger and cargo liners added to the Service of the United Fruit Co. At Left—The QUIRIGUA. Below — The ANTIGUA. Both Built by the Bethlehem Shipbuilding Corp. at the Fore River Plant, Quincy, Mass. A third sister vessel, the VERAGUA, from the same yard, will be ready Aug. 1*





*NO EFFORT or expense has been spared to provide the finest passenger accommodations. Below—General view of the lounge with the writing room in the distance, on the S. S. ANTIGUA*



*ABOVE—Forward end of the writing room on the S. S. ANTIGUA. The entire interior design including furnishings was carried out by the Bethlehem Shipbuilding organization*

The vessels follow the yacht-like appearance of the passenger vessels of the great white fleet. The stem is straight, raked forward; and the stern is of the semi-cruiser type which combines the graceful counter stern above the waterline with the efficient cruiser stern below. A single funnel, placed slightly forward of amidships, and two symmetrical pole masts add a pleasing balance to the shipshape appearance of the hull and superstructure. In accordance with the custom of the United Fruit Co. the entire outside of the ship above the waterline is painted white.

#### Transverse Framing Construction

The hull is of steel, with transverse framing, and is subdivided by eight complete transverse bulkheads into nine major watertight compartments, exceeding the requirements of the 1929 convention for the safety of life at sea.

There are four steel decks in the hull, above which are a long bridge and forecastle combined, with a short poop, separated from the bridge by a well. Side plating is carried up to the bridge deck level throughout almost the entire length of the ship. Deck houses are erected amidships above the bridge deck, and are built throughout of steel, with two decks extending the full width of the ship. The boat deck is sheathed with teak; other decks where exposed to the weather are sheathed with Oregon pine with teak margins. The tops of the deckhouses above the boat deck are of steel insulated underneath by three inches of compressed cork.

Deck covering in all passenger spaces, except as noted below, is rubber tile, laid on unfinished magnesite. The lounge floor is of white oak laid

on top of magnesite; the library floor is carpeted; ceramic tile is used in all baths and lavatories in passenger quarters, and quarry tile in galley and pantry. In crew's quarters, magnesite is laid, generally, for the finished surface. Rubber tile was supplied by the United States Rubber Co., magnesite flooring by Selby & Battersby Co.

All cargo holds are insulated by means of granulated cork with spruce sheathing. A large refrigerating plant is provided, with carefully arranged cooling and air circulating units and ducts in order to provide satisfactory refrigeration for carrying bananas. The cargo space is divided into two holds forward and two aft; the total number of compartments is

sixteen, including two special cargo compartments aft which can be cooled to a lower temperature than the rest. Below the orlop deck aft, the space is utilized entirely for refrigerating machinery and tanks. All cargo refrigerating machinery is the product of the York Ice Machinery Corp.

Cargo handling facilities are provided for general cargo and consist of eight 5-ton booms and one 30 ton, the latter over No. 2 hold. Eight Hyde cargo winches are fitted, all of 2000 pounds capacity at a hoisting speed of 270 feet per minute, each being driven by a General Electric motor rated at 35 horsepower at 550 revolutions per minute. One of these winches forward is connected by gears to a pair of warping heads for use in mooring.

#### Auxiliaries, Electric Drive

A separate mooring winch, of Hyde manufacture, is fitted on the poop deck, driven by a 35 horsepower motor. Two capstans are located on the forecastle, the product of the American Engineering Co. Motors driving them are located on the deck below. A Hyde windlass is fitted to handle the anchors, power being supplied by a 75 horsepower motor. The steering gear is of the electro-hydraulic type, with two rams arranged athwartships; duplicate pumps are provided, and are controlled by telemotor from the wheel house, with arrangement made for operation by gyro-pilot. Emergency steering control is arranged with a trick wheel in the steering gear space and a steering stand on the decking bridge aft. Each pump is operated by a separate motor of 30 horsepower. The steering gear and telemotor were furnished complete by the American Engineering Co.

Lifeboat arrangements are modern

### General Particulars

|   |                              |
|---|------------------------------|
| Owner.....  | United Mail Steamship Co.    |
| Builder.....  | Bethlehem Shipbuilding Corp. |
| Contract signed, ANTIGUA, QUIRIGUA                                    | Aug. 5, 1930                 |
| Keel laid, ANTIGUA.....   | April 30, 1931               |
| Keel laid, QUIRIGUA.....  | May 14, 1931                 |
| Launched, ANTIGUA.....  | Dec. 12, 1931                |
| Launched, QUIRIGUA.....   | Feb. 6, 1932                 |
| Delivered, ANTIGUA.....   | April 1, 1932                |
| Delivered, QUIRIGUA.....  | June 4, 1932                 |
| Classification.....   | American Bureau of Shipping  |
| Length overall, feet, inches.....                                     | 447 10                       |
| Length on designed waterline, ft., in.....                            | 428 9                        |
| Length between perpendiculars, ft., in.....                           | 415 0                        |
| Beam, molded, ft., in.....  | 60 0                         |
| Depth molded, to upper deck, ft., in.....                             | 34 9                         |
| Draft, designed, molded, ft., in.....                                 | 24 0                         |
| Displacement to designed w. l. tons.....                              | 10,928                       |
| Gross tonnage.....  | 6982.5                       |
| Net tonnage.....  | 3178                         |
| Cargo capacity, refrigerated, cu. ft.....                             | 240,070                      |
| Capacity, baggage, mail, etc., cu. ft.....                            | 5,370                        |
| Fuel oil capacity, tons.....  | 1405                         |
| Fresh water capacity, tons.....                                       | 730                          |
| Passenger accommodations, persons.....                                | 113                          |
| Crew, deck 24, engineers 34, stewards 48, pursers, doctor and radio 6 |                              |
| Total Crew.....   | 112                          |
| Total persons on board.....   | 225                          |
| Propellers.....   | Two                          |
| Shaft horsepower, normal.....   | 10,500                       |
| Speed, service, knots.....  | 17½                          |



and complete, with ample capacity for all persons on board. Boats are provided as follows: 5 lifeboats, 25 feet, capacity 50 persons each; 1 motor lifeboat, 26 feet, capacity 37 persons; 3 balsa floats, capacity 25 persons each. Davits are of the Lane mechanical type, and all boats and davits were supplied by the C. M. Lane Lifeboat Co. Two Lidgerwood electric boat winches, driven by 15 horsepower motors, are fitted to handle the lifeboats.

Anchor and cable were supplied by the Baldt Anchor, Chain & Forge Corp. Two main bower anchors of 9415 pounds weight each, a spare bower anchor of 7980 pounds and a stream anchor of 3395 pounds weight are carried. Anchor cables are of 2 7/16 inch forged iron stud link chain, in two 165 fathoms lengths.

The very complete navigating equipment was supplied by the Kelvin & Wilfrid O. White Co., and includes besides the usual binnacles, compasses and other instruments, a hand sounding machine and a Walker taffrail log.

A Submarine Signal Co. Fathometer forms a part of the navigating outfit.

#### Sperry Navigating Equipment

A Sperry gyro-compass system is installed, with master gyro-compass in a separate room in the officers' quarters on the boat deck, and repeaters in the wheel house, on the flying bridge and in connection with the R. C. A. radio direction finder in the chart room. A Sperry rudder indicator system and two Sperry 18 inch incandescent searchlights are installed.

Electrically operated shaft revolution counters were furnished by the General Electric Co. Henschel Electric whistle operators are fitted in addition to hand controls, and one of their telephone systems provides communication between bridge, chief engineer's stateroom, engine room, forecastle deck and docking bridge. Another telephone system is installed for communication between the staterooms of various officers of the ship.

The ship is fully equipped with electrically operated clocks, the master clock being located in the chart room.

Public passenger spaces, foyers, passages, and like; also officers' and crew's quarters, are heated by steam radiators. Passengers' staterooms are heated and ventilated by a thermo tank system which supplies heated air to all rooms; also the forced ventilation to public rooms and to certain storerooms and portions of the officers' and crew's quarters, is heated; assurance is had, therefore, of ample heat under all conditions. Mechanical exhaust ventilation is provided for galleys, pantries, baths and toilets, and smoking room.

The fire detecting and fighting system is in accordance with the most modern marine practice, and includes a Henschel electric automatic fire alarm system, with thermostats lo-

cated in all public spaces, in each stateroom, and in officers' and crew's quarters and storerooms. Alarm of fire is automatically given on an annunciator in the wheel house, with a simultaneous bell signal in the engine room. Manual fire alarm boxes are located in various parts of the ship, and form part of the main electric fire alarm system. The customary Lux CO<sub>2</sub> system, steam smothering lines, and Rich fire detecting system are also installed to cover the boiler room, fuel oil filling stations, and cargo holds; and a firemain and sprinkler system (the latter for protection to the main motors and generators) together with a number of portable chemical extinguishers complete the fire fighting arrangements.

The machinery is twin screw, power being supplied by General Electric motors designed to develop a total of 10,500 shaft horsepower at about 125 revolutions per minute. These motors are of the synchronous induction type, having a rated output of 4200 kilowatts each, continuous load, at 125 revolutions, 3-phase alternating current is supplied at 3150 volts by two turbine-driven generators, each of which is designed for a maximum shaft horsepower of 5500. The steam turbines' revolutions at rated power are 3500, steam being supplied at 325 pounds pressure and 230 degrees superheat by four Babcock and Wilcox boilers of the standard marine type. Total generating surface of these boilers is 22,500 square feet, and inter-deck superheaters of 2250 square feet are fitted. Desuperheaters are fitted to the boilers for supplying saturated steam to certain auxiliaries and feed water regulators are provided. The fuel used is oil, and Todd fuel oil heaters and burners are fitted.

The condensers installed on the ships were designed and built by the Fore River Plant, and are located directly under the main turbine units. A feature of the installation is that the turbine-driven auxiliary generators are arranged to exhaust steam to the main condensers while the ship is under way, making it unnecessary to operate the auxiliary condenser and pumps connected with it, since all auxiliaries normally required at sea are motor driven.

The propellers are 15 feet 6 inches in diameter, and are solid manganese bronze, each having three aerofoil blades. Propellers were cast by the Cramp Brass and Iron Foundries. Kingsbury thrust bearings are installed.

The electrical installation throughout is of General Electric manufacture, including the turbines which drive both main and auxiliary generators, and all electric motors on auxiliaries and deck machinery. Pumps are almost entirely products of the Warren Steam Pump Co.; the lubricating oil pumps, fuel oil service pump, evaporator feed pump, and

priming pump being the only exceptions.

Davis paracoil evaporators and distillers are installed, and all boiler feed water is distilled.

The galley on the ANTIGUA is electrically equipped throughout by Edison General Electric appliances, including a three-section automatic range, broiler, bake oven, egg boilers, waffle irons, toasters, and steam and electric coffee urns. Other galley outfit includes steam kettles, tables, bain maries, dressers, mixing machines, Crescent dishwashing machine, proof-er, vegetable steamer, dough trough, and sinks; and all these were supplied by Jones McDuffee and Stratton. Refrigerators in the galley and pantries are built in, and are operated by the ship's stores refrigerating system. Separate General Electric refrigerators are installed in the lounge pantry on the promenade deck, and in the crew's galley aft. A special General Electric refrigerator is fitted in the beverage room adjacent to the smoking room.

The crew's galley aft is excellently equipped with appliances of the same make and high quality as the main galley. The accommodations for officers and crew are noteworthy as being exceptionally fine; officers' staterooms are equal in furnishings to those provided for passengers.

#### Fine Passenger Accommodations

The interior design and decoration of the public spaces of these ships have been carefully studied and developed. They show a marked superiority over the interiors of other ships of this class, and are comparable to those of any ship afloat. The entire scheme including furniture, carpets and electric fixtures, was designed within the Bethlehem Shipbuilding organization.

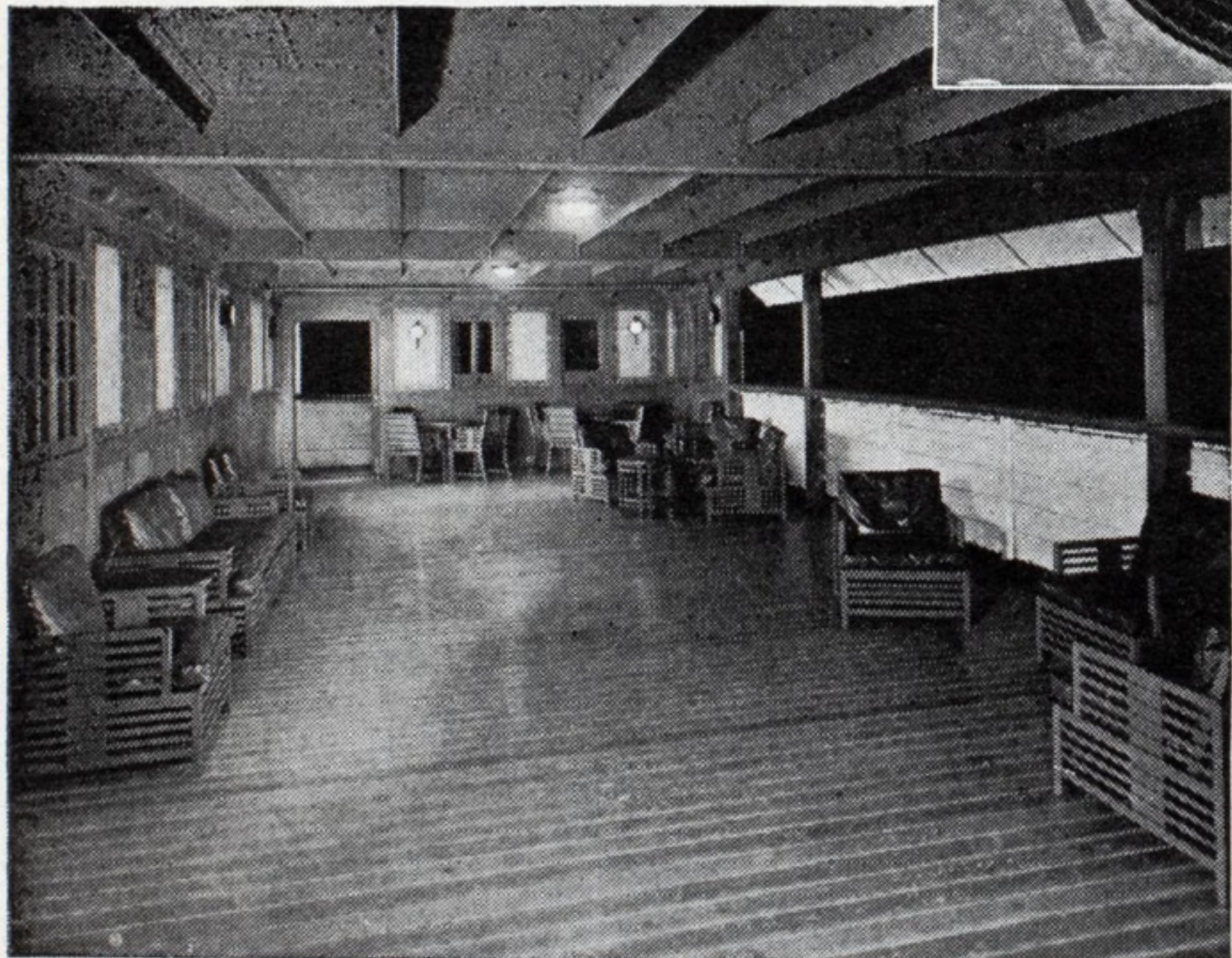
The style as a whole is a simple and refined expression of modern design. The fitness of detail and sturdy character of mass combine to produce a very effective appearance. With the exception of two period style rooms the interiors have an individual character and were developed to meet this particular problem. They represent a decided step in the growth of a design especially characteristic of ship limitations.

The foyers are paneled in mahogany of rich brown with blue rubber tile floors in contrast. Pilasters carrying ceiling beams are topped with small panels boldly carved and colored. The stairs are of the continuous stringer type with balustrades of broad bands of white bronze carried parallel to the run of the stair. The whole design of the stair is original in shipwork and has been developed primarily to suit ship conditions, and this result has been obtained without loss to the decorative quality but with a decided advantage from the point of view of ship operation.

The design of the dining saloon is a clever combination of Empire pe-

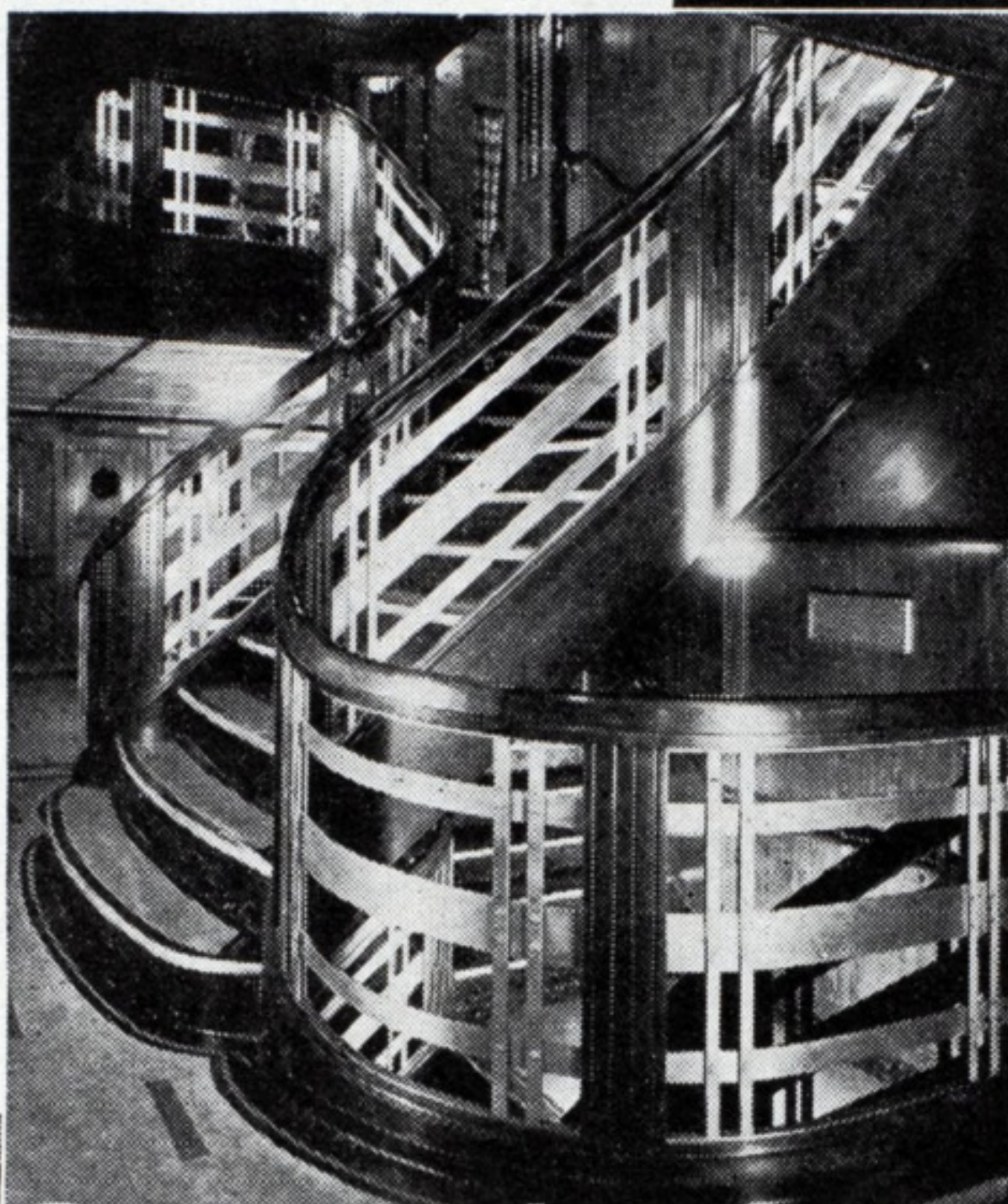


The lounge is in a gayer spirit but yet richly simple. The walls of cross-veneered English bog oak lend a harmonious setting to the blue, green and henna covering of the low furniture. In the after bulkhead is an attractive mural while the forward bulkhead is decorated with a panel of black glass etched with silver and set in a niche flanked with large, fluted, quarter columns with a dull black finish. The ceiling is relieved by a well-proportioned dome of glass capable of spreading a colorful play of light through the room. Large panels of wood carved in the modern manner, some to represent jungle foliage and some tropical fish, and covered with gold leaf toned down with an umber glaze are set over the door openings. The general color tone of this room,



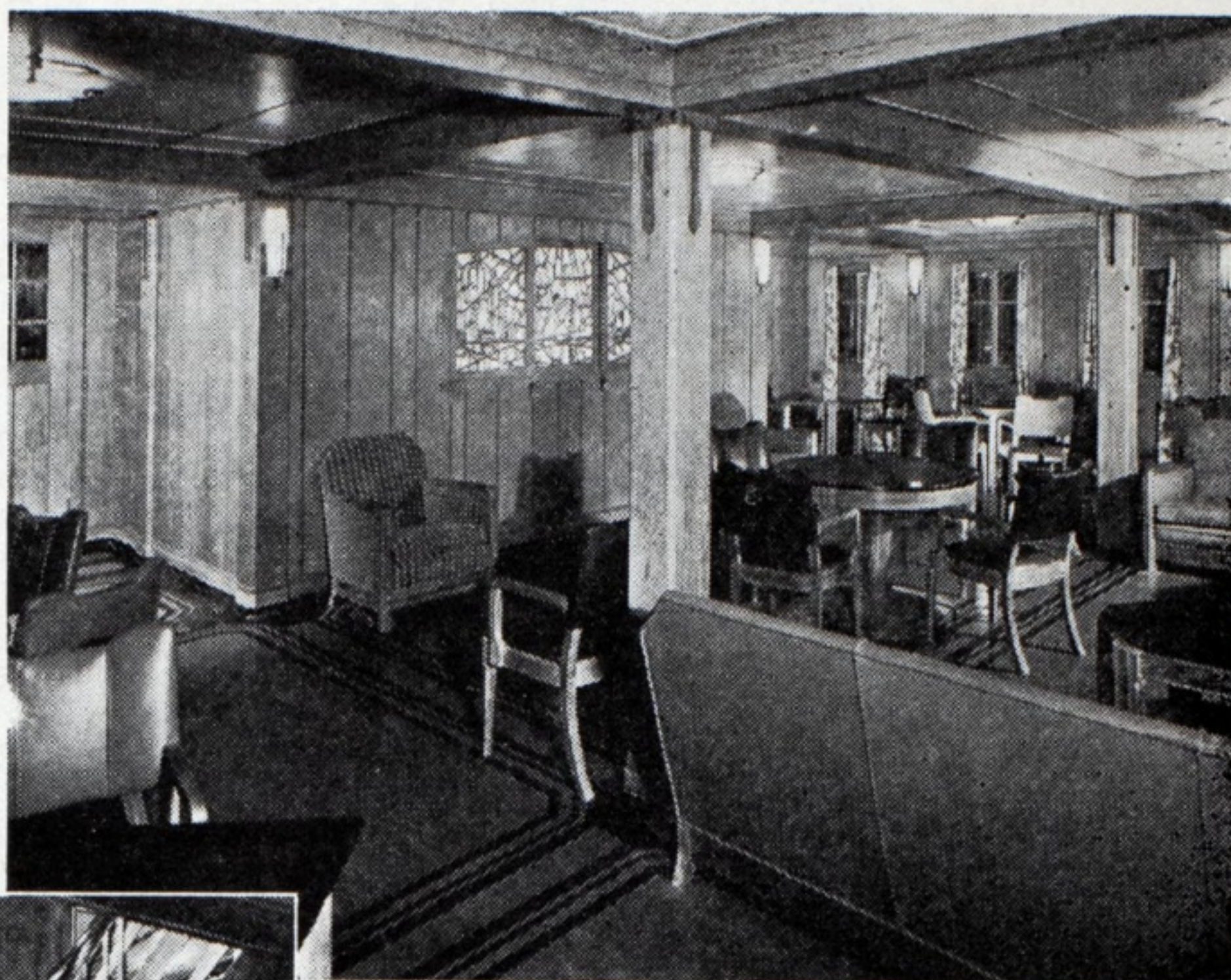
The smoking room is a simple expression of construction and is truly different, entirely simple and yet with a distinctive atmosphere. Sheathed with random-width oak, stained brown with grain brought out slightly in gray, this room is tastefully decorated with red and gold hangings, blue-green and lacquer-red leather up-

XXXXXXXXXXXXXXXXXXXXXXXXXXXX



*At Left—Deck ballroom on the S. S. ANTIQUA. Half open to sea at aft end, designed to represent the courtyard of an old English inn, with half timbered walls*

The deck ballroom, half open to the



All of the public spaces are equipped with radio loudspeakers and the deck ballroom has a hard pine floor for dancing. The electric fixtures were particularly designed to fit the character of the rooms and add greatly to their attractiveness.

The tract of land on which the museum is to be located is about 850 acres in extent and includes a lake of about 160 acres. That portion of the land not needed for museum purposes will be deeded to the State of Virginia as a park. Trustees of the Mariner's museum are, Archer M. Huntington, Mrs. Huntington, C. F. Bailey, director of engineering of the Newport News Shipbuilding and Dry Dock Co., Homer L. Ferguson, president of the shipyard and A. Skinner, counsel for the shipbuilding company.



# SCANPENN—Enters Service

## First of Four Rebuilt Vessels for American Scantic Line

**I**N THE arrangement of the Nordic hall on the American steamer SCANPENN shown at the right the architect has created a strikingly attractive public room. In its simple dignity, comfort, spaciousness and good taste it is comparable to the finest modern home. That such an effect has been possible on a vessel principally intended for carrying cargo is all the more remarkable



**T**HE American Scantic line vessel S. S. SCANPENN was delivered to the owners Moore and McCormack Inc. on June 6, followed by the SCANYORK, SCANMAIL and SCANSTATES on June 19, June 25 and July 2, and will be regularly employed maintaining fortnightly service between New York and Copenhagen, Stockholm, Gdynia, Helsingfors, and Leningrad.

These vessels are of the well known Hog Island "A" type and have been reconditioned by the New York Shipbuilding Co., Camden, N. J. to the designs and under the supervision of George G. Sharp, naval architect, New York city.

The reconditioning consisted of converting the vessels for carrying 74 passengers with appropriate public rooms and deck spaces, together with 40,000 additional cubic feet of cargo space, 16,000 cubic feet of refrigerated cargo space, and strength-

ening the hull against ice from bow to aft end of No. 1 hold. All of their work was done in accordance with the requirements of the international convention for safety of life at sea, department of public health, American Bureau of Shipping and United States steamboat inspection service.

### Passenger Accommodation Unique

Accommodation is provided for 74 passengers, in thirty outside rooms, each with private bath fitted with hot and cold fresh and sea water. A portion of the foregoing is arranged on the patented veranda system developed by Mr. Sharp.

On entering the vessel one is immediately struck by the spaciousness of the public rooms and of the lounging and recreation decks. Instead of the ornate decoration, so frequently met with, there is a noticeable sim-

plicity of architectural treatment which, together with the quiet dignity of the furnishings, suggests the intimacy of home rather than the hotel atmosphere characteristic of so many passenger vessels.

A feature that should make a strong appeal to the traveling public is that passengers taking a Baltic cruise are permitted to disembark at ports enroute and transfer to following steamers, coupled with the additional advantage of short Baltic cruises afforded by connecting steamers, with whom the American Scantic line has arrangements. Shore tours have also been arranged at minimum cost, affording passengers an opportunity to visit points of interest in Denmark, Norway, Finland, Poland, Sweden and Russia.

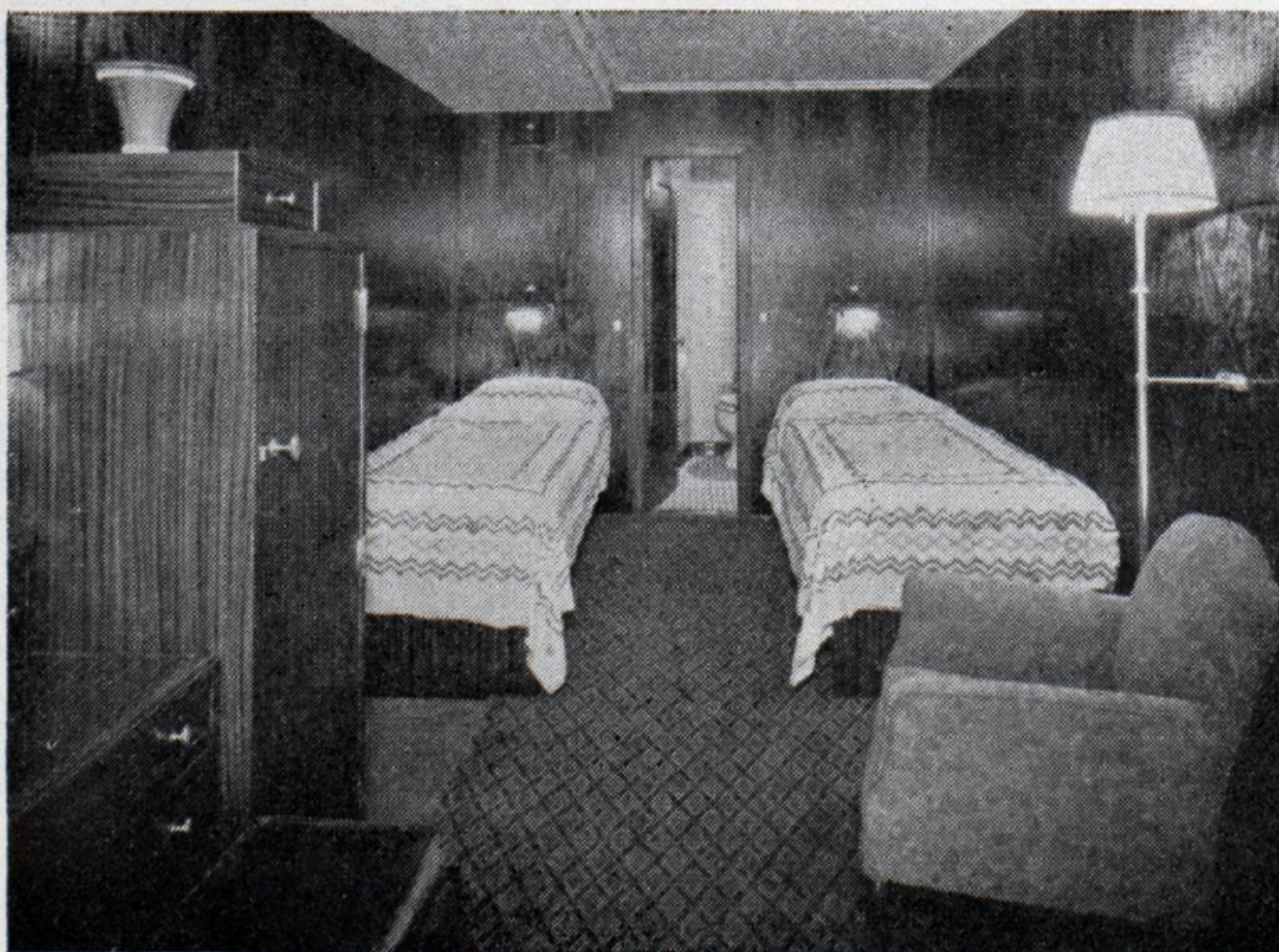
Passengers are also afforded the opportunity of remaining on board the steamers for the full time of the voyage, approximately thirty-five days, without any extra expense, using the steamers as their hotel while in port without incurring any additional expense.

### General and Refrigerated Cargo

In addition to the existing cargo holds a new shelter deck has been added providing about 40,000 cubic feet of cargo space.

Sixteen thousand cubic feet of refrigerated cargo space has been arranged forward and aft the machinery spaces together with a new installation of ship's refrigerated storerooms.

The refrigerated space is located in three holds, fitted for carrying citrus fruit eastbound and products requiring heavy freezing westbound.



*A typical veranda stateroom with bath on the S. S. Scanpenn. One of the unique features is the arrangement of a number of these rooms with entrance from a veranda which adds much to their comfort and attractiveness*



This is an entirely new departure for vessels of this trade, as little or no refrigerated cargo has heretofore moved to or from the territories served by the American Scantic line. The cargo compartments are designed to carry a varied assortment of products which will require temperatures of from 5 to 35 degrees.

The refrigerating plant consists of cooling three cargo spaces totalling 17,300 cubic feet, and six ship's stores refrigerators totalling 3,908 cubic feet; also one water cooler for circulating ice water.

To accomplish the necessary cooling and provide a flexible refrigerating system there are installed two compressors as manufactured by the Brunswick-Kroeschell Co., a division of Carrier Corp. These compressors are of the vertical, single acting, double cylinder type, each direct connected to a 25 horsepower marine type, electric motor. Duplicate condensers, brine coolers and brine pumps are also furnished.

#### Electric Power and Auxiliaries

Each vessel is equipped with two 75 kilowatt generators consisting of Winton diesel direct connected to Westinghouse direct current generators. These sets furnish power for electric kitchen, refrigeration, lighting and ventilation.

Mechanical supply and exhaust is fitted to all passenger spaces, kitchen, refrigerated boxes and machinery spaces, generating machinery spaces and propelling machinery spaces. All living quarters are heated by individual Fintube steam radiators under direct control of occupant of each room. Public rooms are heated by air circulation through same type radiator.

All bulkheading is fire resisting, consisting either of structural steel, armorply by United States Plywood, Co. or micarta veneered panels by Westinghouse Co. Below the bridge deck all doors are hollow steel bulk-

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It has been the fashion in many quarters to question the fitness of Americans generally to successfully manage the business of operating ships in competition with the thoroughly experienced and reputedly skillful Europeans. The fundamentals for success however are the same in all lines of endeavor. One of these fundamentals, which no one can deny is an American characteristic, is the initiative and vision necessary to create an atmosphere pleasing to the customer. By this intensive effort to please the customer business has profited in many lines ashore. The splendidly conceived and executed reconditioning of these freighters for the Scantic line, following a number of similar conversions for other lines, is an indication that the American's genius for pleasing his customer does not entirely leave him when he goes to sea.

Editor's Note

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head panels and connected by hollow steel joints which together with door bucks have been developed by the designer.

Furniture in the staterooms is of metal consisting of patent combined dressing table and wardrobe unit, metal bed with drawers under and

concealed ceiling pullman berths supplied by the Simmons Bed Co. The combined dressing table and wardrobe units, hollow steel doors and bulkhead joints were made by the Jamestown Metal Desk Co.

Among other manufacturers who participated in the conversion of these vessels are John Wanamaker, public room furnishings and draperies; lighting fixtures and lamps, Cassidy Bros., New York. The airports in the passenger accommodations are of the Stone "stirrup" type furnished by the American Locomotive Co. Enclosed promenade deck and veranda windows are of the vertical sliding type furnished by the Kearfott Engineering Co.

An automatic leveling accommodation ladder was supplied by Elisha Webb. All deck coverings were furnished and applied by Selby Battersby Co.

#### American Equipment Furnished

Marine hardware was supplied by the H. S. Getty Co. For the galleys; the electrical equipment was furnished by Edison Electric Appliance Co. and the steam equipment by Dougherty and Elisha Webb companies. Electric refrigerators in the pantry are of Frigidaire make and in the smoking room Seegar. New pumps fitted are of Worthington Pump & Machinery Co. make. Fire detection and extinguishing include, in passenger spaces the Garrison system, in the holds the Lux Rich system and in machinery spaces Foamite.

The American Scantic line, Moore & McCormack Co., owner, has expended approximately \$1,250,000 on these four vessels in order to make them the finest of their class plying between New York and Northern Europe. It is significant that the last three to go into commission have capacity bookings for the maiden trip.



*S. S. Scanpenn Sailing from New York for Scandinavian and Baltic ports, June 11. First voyage after reconditioning by New York Shipbuilding Co. for Moore & McCormack Inc., Owner and Operator. Three sisterships will follow*



# New Patrol Fleet For Coast Guard

## In Operation Out of New York Harbor

**T**HE United States coast guard has now acquired a fleet of patrol boats eminently suited for that particular service. Heretofore, it has been handicapped by a lack of suitable units and has had to employ obsolete vessels neither fitted for the service nor economical to operate.

Completion of a fleet of seven 165-foot patrol boats by the Bath Iron Works Corp. now gives to the coast guard vessels specifically designed for inshore or offshore work, of suitable speed, economical in operation, possessing extraordinary seaworthiness and with all other characteristics needed in the difficult work of patrolling the coast.

Bids for these ships were called for in January 1931 and the Bath Iron Works Corp. was successful in getting the order for the seven vessels then authorized. The first vessel the THETIS was completed and delivered Nov. 27, 1931 and the last one PERSEUS was delivered April 23, 1932. The names of the boats, from Greek mythology, are THETIS, AURORA, CALYPSO, DAPHNE, HERMES, ICARUS and PERSEUS. General characteristics are noted in the accompanying table.

### Model Basin Tests Conducted

The approved design of these boats was selected subsequent to a series of model tests which were planned principally with the thought that the vessels should be light in construction though rugged and seaworthy as possible and yet develop the maximum speed. The diesel power decided upon called for certain radical changes in

### General Particulars

|   |   |
|---|---|
| Owner.....                                    | United States Coast Guard                                   |
| Builder.....                                  | Bath Iron Works Corp.                                       |
| Number.....                                   | Seven   |
| Names—  | THETIS, AURORA, CALYPSO, DAPHNE, HERMES, ICARUS and PERSEUS |
| Contract awarded.....                         | Jan. 9, 1931  |
| Contract price, each.....                     | \$195,000   |
| Delivery—First, THETIS.....                   | Nov. 27, 1931   |
| Delivery—Seventh, Perseus.....                | April 23, 1932  |
| Length overall, feet, inches.....             | 165 0   |
| Length between perpendiculars, ft., in.....   | 160 9   |
| Beam molded, on waterline ft., in.....        | 24 1  |
| Beam molded at main deck, ft., in.....        | 25 3  |
| Depth molded, amidships, ft., in.....         | 13 2  |
| Draft, maximum, feet, inches.....             | 9 0   |
| Draft, mean, feet, inches.....                | 7 6   |
| Displacement loaded, tons.....                | 332   |
| Cruising radius, nautical miles.....          | 4000  |
| Bunker fuel capacity, tons.....               | 26.7  |
| Propellers, number.....                       | 2   |
| Main engines, 2, Winton diesels, h.p. ea..... | 670   |
| Speed in Service, knots.....                  | 16  |
| Crew, number in.....                          | 38  |

the general characteristics, but the results well illustrate the use of comparatively light steel, the reduction of the midship freeboard and the elimination of all unnecessary weight in construction. The speed requirements 16 knots were met and the seaworthiness was found to be satisfactory to the trial board.

As will be noted from the accompanying illustration of the launching of the PERSEUS, the boats are high forward to assure dryness. The bow above water has a slightly roundnosed section, not so much for the sake of increased buoyancy, but rather with the thought that the sharp straining of steel to form a graceful flare is not so practical as easier molding. The amidship section drops off rapidly to afford only the necessary freeboard.

Underway, the boats show fine overall lines, accentuating the appearance of speed.

There are two decks; the berth deck and main deck. Six complete transverse watertight bulkheads and two oil-tight bulkheads divide the hull into nine compartments. The fuel tanks are amidships. All bulkheads extend from the keel to the main deck.

Arrangement of the berth deck starts with a hold for the paint and oil stores and the chain locker forward. Quarters for a crew of 38 men follow, and aft of these are four staterooms for officers. The fuel oil tanks are immediately forward of the engine room and the galley is situated aft of the engine room on the port side and adjacent to the crew's messroom which is followed by the officers' messroom. The fresh water tanks and the magazine are in the hold.

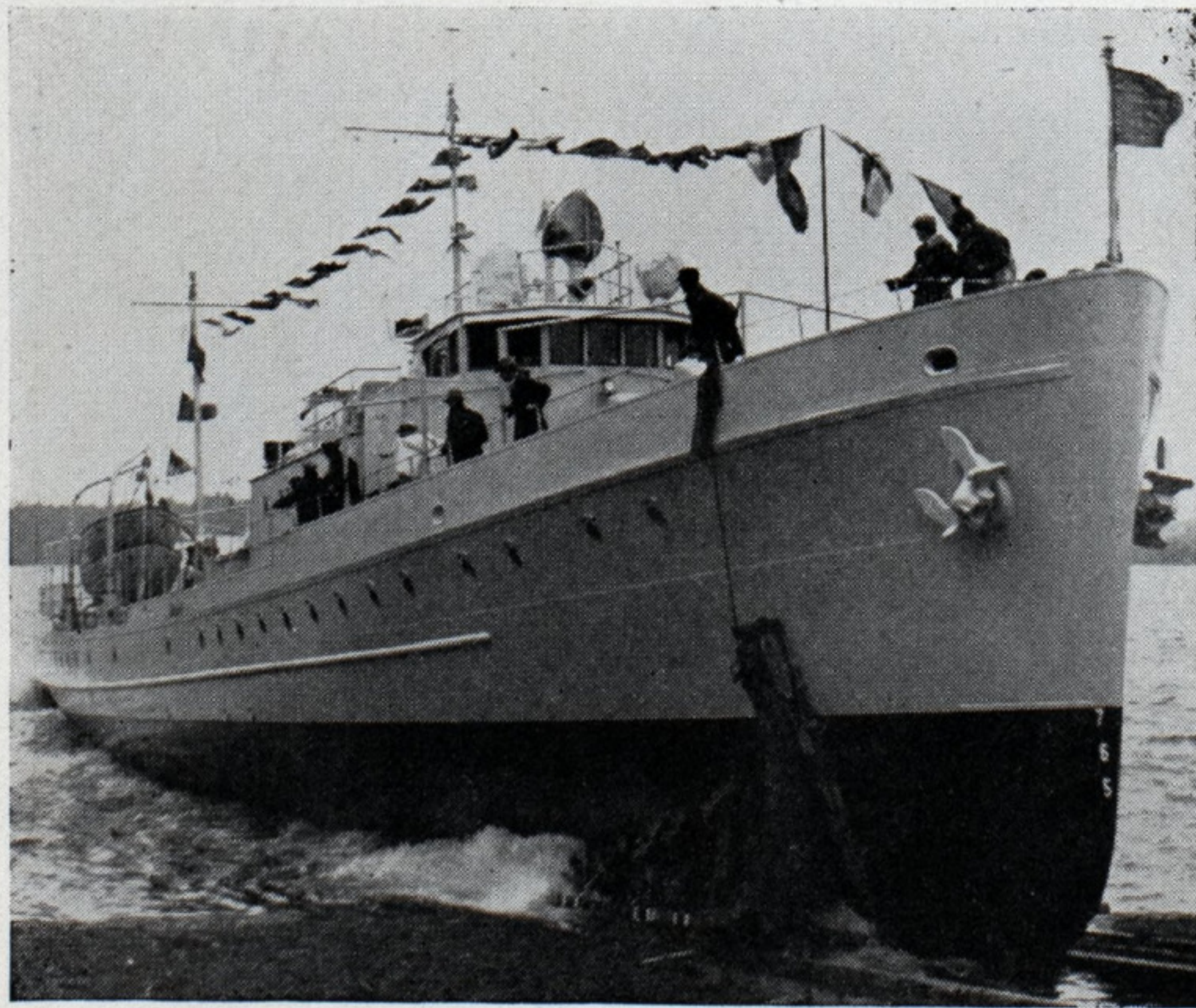
Forward on the steel-plated main deck is a 3-inch gun and two companion hatches for entrance to the crew's quarters. On either side of the pilot house is a one-pounder gun.

The pilothouse, elevated slightly over the deckhouse to afford four-way vision, is fitted on top with a standard compass and three 18-inch Sperry searchlights. The commanding officer's stateroom is forward in the deckhouse and the radio room is on the port side of the deckhouse. A Universal auxiliary generator is carried above the radio room. Wash rooms for both officers and crew are situated in the after part of the deckhouse. Small-boat equipment carried includes two 19-foot surf boats and two 19-foot dories.

### Two Winton Diesel Engines

The pair of main engines are Winton diesel, 4 cycle, 6-cylinder units with 14-inch bore and 16-inch stroke. They are rated at 670 horsepower turning at 450 revolutions per minute. In trial runs of the THETIS over the Rockland, Me. course, the motors turned 457.6 revolutions per minute and the vessel showed a maximum of 16.067 knots to meet specifications. The engines were reversed from full speed ahead to full speed astern in 30 seconds. The auxiliary equipment was also supplied by the Winton Engine Corp.

The steering system, developed by Sperry Gyroscope Co. is unique in that it employs a combination electric and manual control instead of the customary method of disengaging the latter while steering with electric power. Movement of the steering wheel es-



*Perseus, last of the seven 165-foot twin screw Winton diesel propelled patrol boats for the U. S. Coast Guard, launched April 13, by the Bath Iron Works Corp., Bath, Me. The Perseus delivered April 23, is now operating with other units of this fleet out of Stapleton, Staten Island, N. Y.*



establishes an electrical contact with the steering motor and sets it into operation and the motion continues only so long as the wheel is moved, except for a deliberate play allowed between the movement of the manual shaft and the connection with the motor. An electro-magnet then holds the rudder in the set position and there is no stress on the wheel. Failure of the current naturally eliminates the power of the magnet and the helmsman assumes manual control.

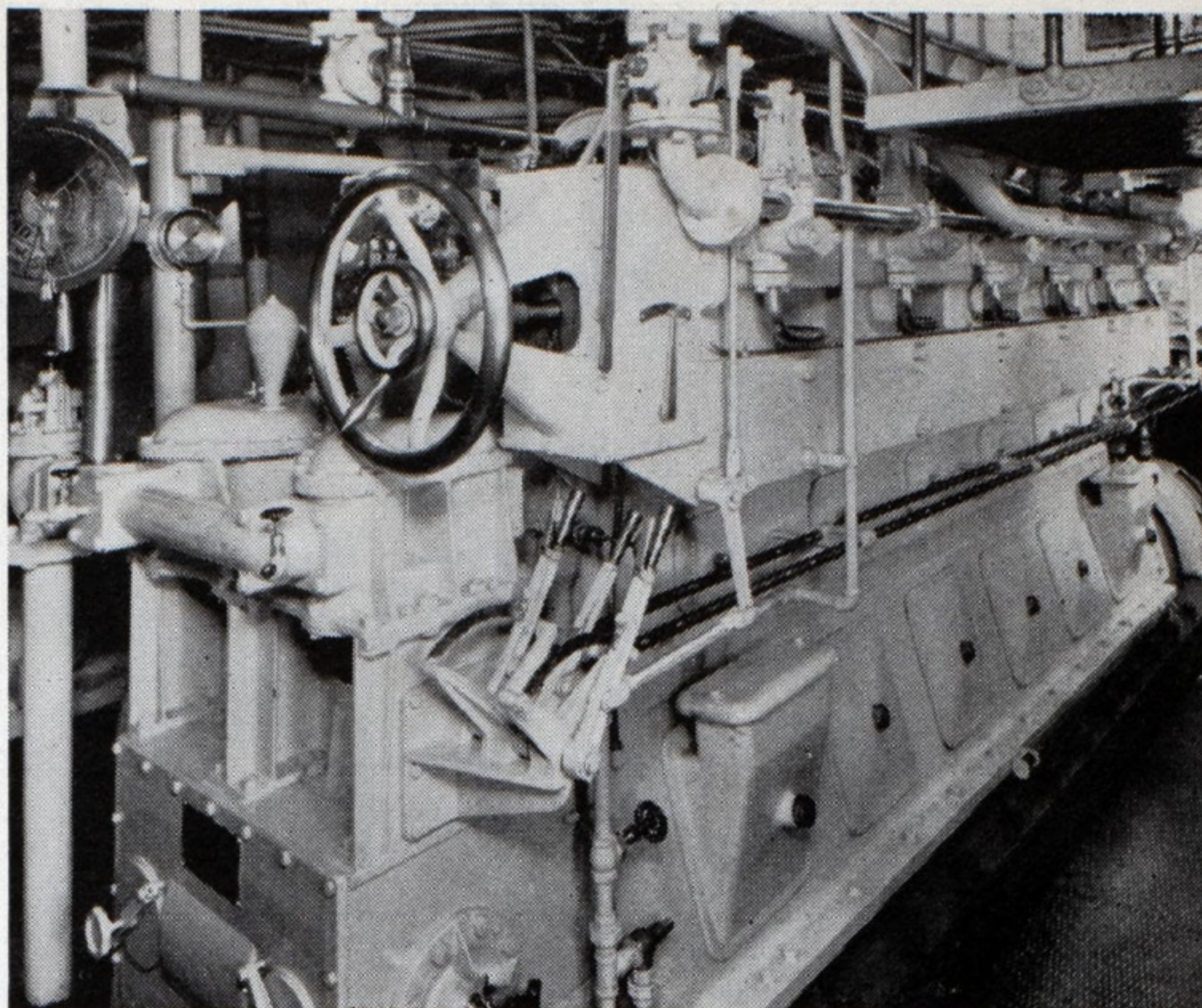
The designers of the vessels, having in mind the continuous-duty requirements of these ships, exercised the greatest care to secure maximum structural strength. For instance, the customary propeller strut supports in boats of this size were changed so that the twin shafts are supported at the stern tubes, by intermediate struts and finally by a continuation of the shafting aft of the propeller where it is fitted into a bearing on the forward side of twin rudder posts. This provides not only excellent rigidity, but it also affords better water forward of the wheels because the after propeller strut is omitted. The twin rudders aid in quick turning and maneuvering.

#### Pumps and Other Auxiliaries

The lubricating oil system is virtually in duplicate to allow continuous service and to insure operation even should one unit break down. The principal circulation system, consists of two pumps on each main engine, one drawing oil from the sump of the crankcase and delivering it to the filter tanks located forward on either side. The other pump draws oil from the filter tanks, sends it through the cooler placed against the forward bulkhead and discharges it to the distribution system on the engines.

Among the independent pumps are two Viking rotary pumps driven by a 7½ horsepower Diehl motor connect-

*Engine room of the Aurora one of seven Coast Guard Patrol boats built by Bath Iron Works Corp. Each vessel is powered with two Winton diesel main engines; 6-cylinder, 4-cycle, 14 inches bore and 16 inches stroke; airless injection, direct drive; each developing 670 h.p. at 450 r.p.m.*



ed through the lubricating system. For cleaning of the oil, a Hydroil purifier is set immediately aft of the independent pumps. The purifier draws the oil from the crankcase and returns it to the used oil tank.

For serving the fuel oil transfer system there are the Winton pumps on the main engines and one additional Winton rotary pump with a one-inch suction, driven by a Westinghouse, 1 horsepower 120-volt motor turning 700 revolutions per minute. An auxiliary bronze rotary hand pump built by the Gould Pump Co. may be used to deliver 10 gallons per minute from the bunkers to the service tanks.

On the starboard side of the engine room is a two-stage centrifugal fire pump, built by the Warren Steam Pump Co. It has a capacity of 100 gallons per minute and is driven by a 10 horsepower 115-volt Diehl motor. Suction connections are extended to its own sea chest, the main sea chests through the engine oil coolers and to the engineroom bilge. Discharge connections extend to the fire mains, to the engine cooling system and overboard.

For pumping bilges there are five 1½-inch ejectors operated by water taken from the fire main. In addition to the power bilge pumping system, there are three hand pumps on the berth deck, connected to the engineroom bilge and the two forward bilges.

#### Motor Driven Air Compressors

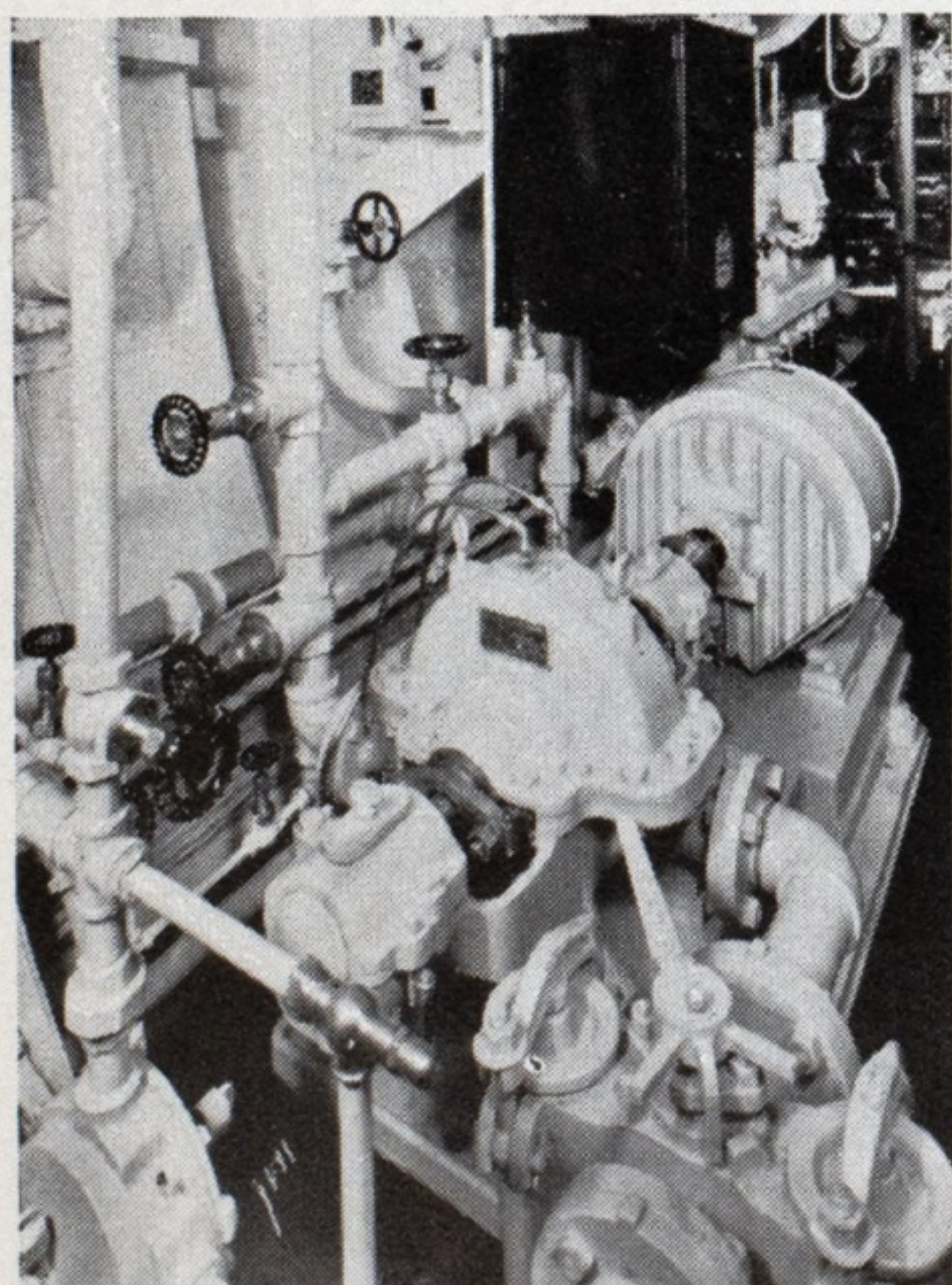
The main air compressor, built by Ingersoll-Rand, has a displacement of 40 cubic feet at 875 revolutions per minute and maintains a pressure of 500 pounds in ten steel tanks located in the engine room. The compressor is driven by a Westinghouse 12½ horsepower 120-volt motor. A separate compressor, installed to supply air for the whistle, was built by the National Brake & Electric Co. It has a displacement of 11 cubic feet per minute, 100 pounds working pressure and derives its power from a Westinghouse, 2

horsepower, 115-volt motor. A Cutler-Hammer automatic switch maintains the constant pressure.

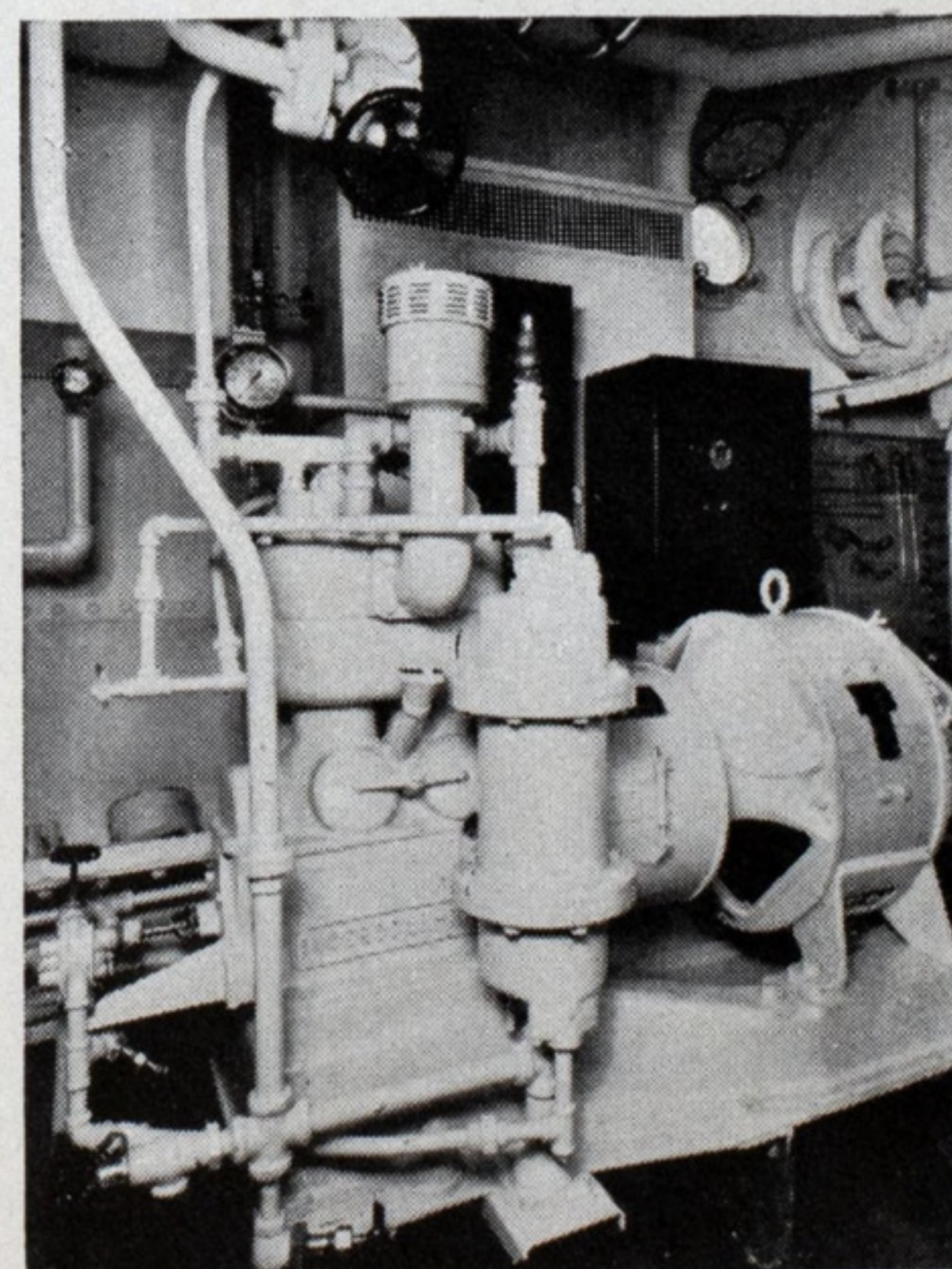
Radio equipment covers the full range for reception and transmission. The high frequency receiver was built by RCA-Victor and the intermediate frequency receiver was built by Charles R. Speaker & Co. The motor generator set for the short wave transmitter was delivered by the Western Electric Co. and the transmitter itself was manufactured by the Weston Electrical Co. In addition to the motor generator set for the long wave length radio, General Electric also delivered a transmitter for the 600-1200 meters set, so often in use in shipping.

The radio direction finder was manufactured by RCA-Victor and the emergency power plant for the radio was manufactured by the Universal Motor Co., consisting of a 5-kilowatt set capable of operating the radio systems or charging the batteries, of

*(Continued on Page 44)*



*Fire Pump on the Aurora, 2-stage centrifugal, Warren make, Diehl motor*



*Main Air Compressor of Ingersoll-Rand make on Coast Guard Patrol Boats*



# Officers in Navy and Army Win Arc Welding Prizes

**F**IRST and second awards in the second Lincoln Arc Welding Prize Competition sponsored by Lincoln Electric Co., Cleveland, were won by officers of the United States navy and army. First prize of \$7500 went jointly to Lieut. Commander Homer N. Wallin and Lieut. Henry A. Schade of the navy and second prize of \$3500 to Major G. M. Barnes of the army.

Approximately 400 papers were submitted in the competition and were reviewed by the jury under the direction of Prof. E. E. Dreese, Ohio State university, Columbus, O. A resume of the savings to be effected by using arc welding extensively in all industries was estimated to be almost a billion dollars a year, provided the process is used as extensively as possible.

Both Lieut. Commander Wallin and Lieut. Schade were members of the construction corps at the navy yard, Mare Island, Calif., although the latter since has been transferred to Washington. The title of their paper was "The Design and Construction of an Arc-Welded Naval Auxiliary Vessel."

Major Barnes is chief of design and engineering, ordnance department, Watertown arsenal, Watertown, Mass., and the title of his paper was "Manufacture of Ordnance at Watertown

Arsenal Revolutionized Through Arc Welding."

"The Application of Arc Welding to the Design of Steel Buildings for the Resistance of Earthquake Forces," won third prize of \$1500 for H. H. Tracy, structural engineer, Southern California Edison Co. Ltd., Los Angeles.

A \$750 fourth award went to Gustav F. D. Wahl and Harry E. Johns, Kiel, Germany, for a paper on a special river-sea bulk cargo ship. H. J. L. Bruff, Harrowgate, England, won fifth prize of \$500 for "Strengthening Weak Iron and Steel Bridges by Arc Welding." A paper on arc welding steel cars won \$250 for William H. Zorn, Wyandotte, Mich. Thirty-five additional prizes of \$100 were awarded to writers of papers which showed the application of and savings possible by arc welding in every industry.

## Welding Auxiliary Vessel

The first prize winning paper describes the construction of an arc-welded auxiliary vessel for use with the fleet at San Pedro. The hull is conventional ship-shape in form and 118 feet long, with a full-load displacement of 300 tons. Speed of the craft is 10 knots.

Arc welding had never been used in the construction of gun carriages until the 3-inch antiaircraft mobile

mount described in Major Barnes' paper was built. This piece of ordnance was selected because, in addition to being the most modern type of post war carriage standardized by the army, it was subjected to severe road tests as well as the impact forces of firing. The principal parts of the carriage are highly stressed and of intricate design. Welding is now an approved method of manufacture for ordnance structures.

Mr. Tracy's paper on arc welded steel buildings to resist earthquake shocks deals with the construction of a 13-story general office building of the Southern California Edison Co., Los Angeles. By application of arc welding, the structure will resist seismic shocks of an intensity comparable to those of the San Francisco and Tokyo earthquakes.

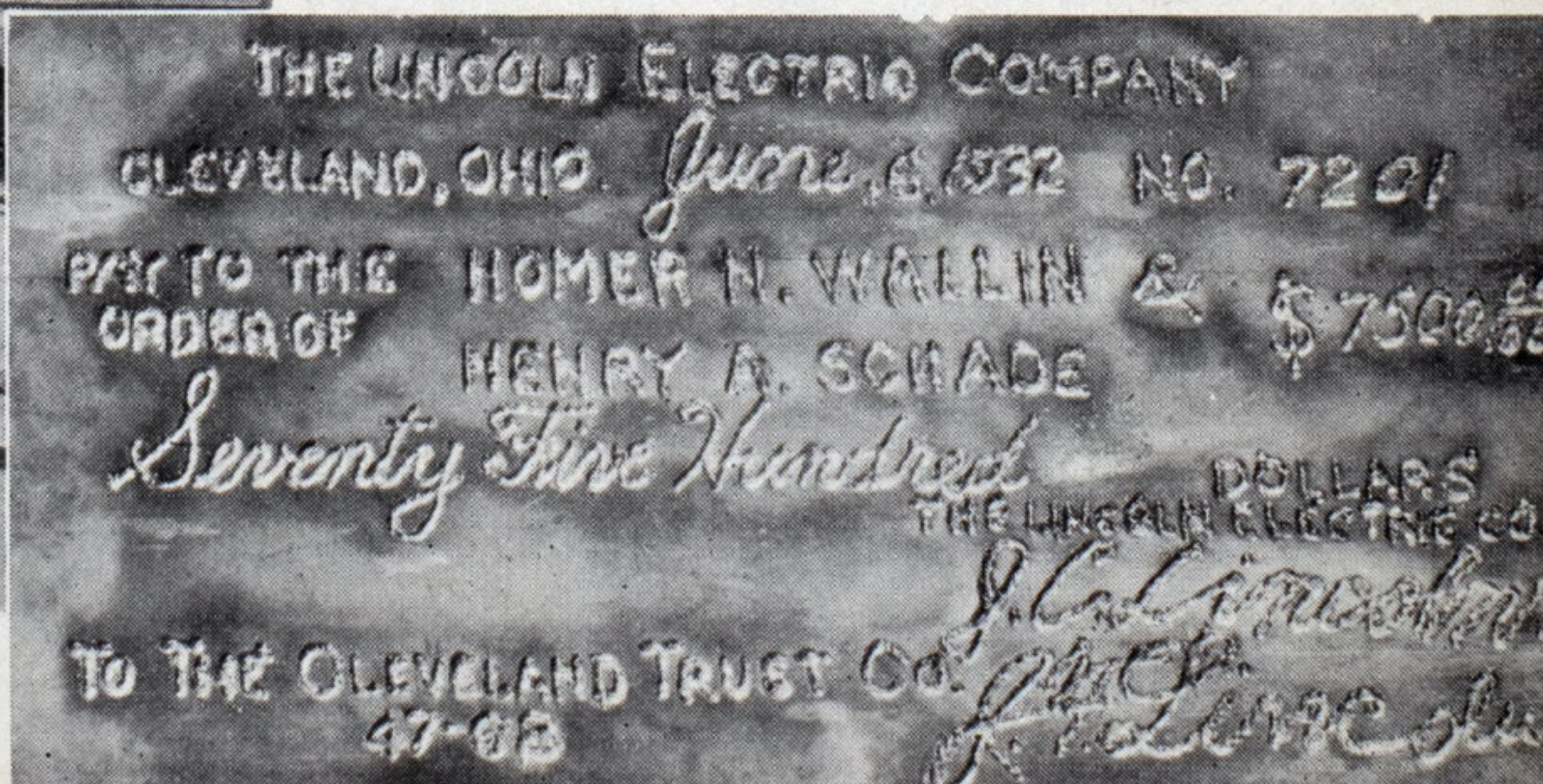
## Checks Won't Bounce

The first three prize winners received what are believed to be the most unusual check ever issued. These checks, for \$7500, \$3500 and \$1500 respectively, were "written" on 1/8-inch sheet steel. Each check was 24 inches long and 10 inches wide. All information, including date, amount, payee and name of bank was arc welded, welding operators in the Lincoln plant relieving the treasurer's office of this detail. The checks were signed by arc welding, the illustration on Page 9 showing J. C. Lincoln affixing his signature. A close-up view of the first-prize check is shown on this page.

The prize winners will endorse the checks by the same novel method and when the panels of steel are presented to banks and paid, they will be returned to the bank of issue, where guards will cancel them with the aid of a submachine gun.



*AT THE left are shown Lieut. Commander Wallin and Lieut. Schade, first prize winners in the Lincoln arc welding competition. The completely arc-welded vessel described in their paper appears in the background. Below is the steel check used to pay the winners \$7500. Second and third prize winners were paid in the same way. The checks will be canceled by machine gun*





# Painting in Protecting Ships' Bottoms

## Against Corrosion and Fouling

By E. C. Powers\*

THE problem of protecting the bottoms of steel vessels from corrosion and fouling is one of great importance to operators. Huge sums of money have been laid out not only in the direct expense of painting, but also in extensive research and experiment for developing effective anticorrosive and anti-fouling paints. The bureau of construction and repair of the navy department has experimented with various sorts of bottom coatings, developed others and carried on elaborate tests both with stationary submerged plates painted with various compositions and by actual service of vessels painted with the different paints.

Protecting the bottoms of vessels resolves itself into two separate problems, that of treating the surface so that the metal will resist corrosion and having done that to protect the surface from the fouling effect of barnacles (animalculae, etc.) attaching themselves. Both of these functions must be served by the paint or paints which are applied to the bottoms of steel vessels operated in salt water.

### Protection Against Corrosion

Corrosion is a reaction between the metals and water. All metals have a tendency to dissolve in water and the rapidity of the dissolution is dependent upon the degree of concentration of hydrogen ions in the water. A factor which very definitely influences corrosion is the degree of activity of the surface of the metal in hastening the union of oxygen and hydrogen. As this union is made more easy, the solution of the metal takes place more rapidly. The truth of this is made apparent when zinc, which has a more accelerating effect on the union of oxygen and hydrogen than iron, is placed in contact with the iron, the hydrogen, which is released from the zinc as it dissolves, forms a plating over the iron. The zinc corrodes very rapidly while there is no corrosion at all in the iron. This condition lead to the use of zinc in contact with iron in salt water to prevent corrosion of the iron.

The substance familiarly known as rust is the oxidation of the ferrous hydroxide which is formed by the action of the water on the metal. Rust is not corrosion but merely the evi-

dence that corrosion has taken place. The solution of a metal in water is accompanied by a flow of electricity. This type of electric flow is not an agent of electrolytic corrosion which is due to some electromotive force flowing from a metal through its surroundings. Where such an electric current is present, corrosion will take place very rapidly.

### Preparation of Surfaces

Corrosion occurs readily in salt water because the salts which dissociate in water produce an acid reaction which incites corrosion. In calcium chloride brine, metals have been found to corrode in the following order, starting with that having the least tendency: Bronze, brass, iron-copper alloy, copper, wrought iron, mild steel, cast iron, solder, lead, zinc, and galvanized iron. When the brine is saturated with air, it has been found that corrosion takes place about three times as fast as when no air is present. This accounts for the great corrosive action of salt spray which is nothing more or less than a brine solution saturated with air.

Corrosion can be reduced by several methods: By the use of a coating of protective metal such as zinc, tin, lead, nickel, or copper; by the production of magnetic oxide of iron on steel surfaces; by rendering the surface of the metal passive; and by the application of protective paint. It is with the latter method that we are concerned here.

In order to minimize corrosion by

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### A Painting Specification

ONE coat of anticorrosive and one coat of antifouling paint shall be applied with hand brushes to the under water body. The paint shall be thoroughly stirred before applying. The name of the dredge, the dredge, the department and the draft figures on each side of the bow and on the stern shall be repainted. Sea chests, strainers and sea valves shall be painted with two coats of antifouling paint after a thorough cleaning. Antifouling paint on hull shall be supplied one day before the undocking of the dredge.

The anticorrosive and the antifouling paint will be applied by the United States. Approximately 40 gallons of anti-corrosive and 60 gallons of anti-fouling paint shall be applied.

Note: The above is the specification for painting the bottom of the United States Engineers dredge SAN PABLO, San Francisco, June 9, 1932.

the application of protective paints, the manner in which the surfaces are prepared to take the paint is important. Before painting new metal, all rust spots should be thoroughly cleaned off with a wire brush, scraper or sandblast. The oxide scale should be removed from the surface and the metal washed and completely dried before painting.

The priming coat for a steel surface should be made of linseed oil containing corrosion inhibitive pigments such as basic chromate of lead, red lead, basic sulphates of lead, zinc oxide, iron oxide, zinc chromate, etc. Paints containing these ingredients are widely used by the United States navy and merchant marine for protection of steel vessels. Paints containing graphite, carbon black or lamp black should not be used as a priming coat for metal because they are apt to excite corrosion on account of their electrical conductivity.

Red lead is probably the most common element used in painting ships' bottoms to minimize corrosion. Red lead is made by roasting metallic lead or lead compounds in a specific form of reverberatory furnace. As red lead is a mixture of the peroxide and protoxide of lead it is important that the proper proportion between these two be obtained. The proportion of the two depends on temperature, the amount of air, and the amount of moisture in the air, also on the type and handling of the furnace. It is because of these variable percentages that so many different results are obtained from the use of red lead. It has been established that the proper proportion of red lead in linseed oil is 30 to 35 pounds of red lead to the gallon of oil.

### Cannot Combine Both Functions

To date, it has not been possible to develop a satisfactory paint in which the essential properties of both anticorrosive and anti-fouling coatings are combined. Since the function of anticorrosive paint is to protect the steel against corrosion and since zinc is electro-positive to iron, a hull will be protected from corrosion assuming that the film remains intact by the utilization of zinc pigments. Its effectiveness will be lost, all other factors being disregarded, when the zinc has been entirely expended. It has therefore been customary to incorporate rust inhibitive pigments such as zinc dust, zinc oxide, iron oxide and silica in the

\*This is the first instalment of an article in two parts. The second part will appear in the August MARINE REVIEW.



anti-corrosive paint. Formula 14RB, given on this page indicates a suitable proportion of zinc oxide in the mixture. Paint is made in accordance with this formula at a cost of about 70 cents per gallon.

#### Fouling Increases Operating Cost

Fouling is one of the biggest items contributing to the cost of upkeep of salt water vessels. The annual expense of shipping interests in the United States due to fouling of vessels is conservatively estimated as being more than \$100,000,000. Steamship companies must clean the bottoms of their vessels at least every eight months. It has been said that it costs \$100,000 to dry dock, clean and repaint the bottom of the LEVIATHAN.

If corrosion were the only factor to be considered in painting ships, the problem would be far easier. Protection against fouling is, however, the real problem. In addition to the actual expense of drydocking, cleaning and repainting a vessel as a result of fouling, ship operators are annually required to bear the brunt of other expense caused by fouling, viz: Speed is diminished as much as 50 per cent; the voyage is delayed 10 to 50 per cent of the total time; fuel consumption is increased by as much as 40 per cent; wear and tear on machinery is increased; practically two weeks to one month out of every year during which the vessel might be profitably employed is lost in the annual job of repainting.

Because of the desire to avoid excessive dry docking charges, most ship bottom paints today are of the quick-drying spirit varnish type, that is, they dry by evaporation of a volatile solvent and not by oxidation of a drying oil. Gum shellac was used formerly by the navy as a vehicle in this connection but due to difficulties in the procurement of gum shellac, which were aggravated in time of war, it was found desirable to avoid the use of shellac and to develop a paint that would incorporate domestic materials. However, gum shellac has again come into use. A formula will be given in the second part of this article.

#### Formulas for Protective Paints

After considerable investigation by the bureau of construction and repair of the navy department, the coal-tar type of coating was developed. These were the navy standard formulas 14RB and 15RB composed as follows for 100 gallons:

##### 14RB (Anticorrosive)

| Ingredient                       | Pounds |
|----------------------------------|--------|
| Zinc oxide (dry) .....           | 187    |
| Venetian red (dry) .....         | 93     |
| Silica (dry) .....               | 93     |
| Rosin .....                      | 146    |
| Coal-tar naphtha .....           | 383    |
| Coal-tar .....                   | 48     |
| Manganese linoleate .....        | 130    |
| Beeswax .....                    | 3.3    |
| Weight per gallon, pounds.....   | 10½    |
| Spreading rate per gal., sq. ft. | 325    |

##### 15RB (Antifouling)

| Ingredient                       | Pounds |
|----------------------------------|--------|
| Zinc oxide (dry) .....           | 212    |
| Silica (dry) .....               | 82     |
| Magnesium silicate (dry) .....   | 83     |
| Cuprous oxide .....              | 112    |
| Mercuric oxide .....             | 45     |
| Rosin .....                      | 202    |
| Coal-tar naphtha .....           | 288    |
| Coal-tar .....                   | 133    |
| Pine oil .....                   | 74     |
| Weight per gallon, pounds.....   | 12½    |
| Spreading rate per gal., sq. ft. | 325    |

Where direct comparative tests have been carried out, the coal-tar rosin paints appear to be equal to the shellac paints and, in general, superior to any of the commercial coatings.

The procedure adopted by the navy in experiments with protective coatings for ships' bottoms is: First, to observe the results on panels submerged in a favorable location as regards fouling propagation.

Some years ago when the bureau of construction and repair was making a very extensive biological study of fouling, test racks were constructed at the bureau of fisheries laboratory at Beaufort, N. C., also at Hampton Roads, Va., and recently at the naval base at San Diego, Calif., the latter to study conditions in West coast waters.

In those cases in which the results from the panel tests warranted, additional data were obtained by applying the paints in question to the bottoms of active vessels. This procedure requires considerable time before the value of the particular coating can be properly appraised, but it is the most reliable yet devised and was followed by the bureau of construction and repair in the development of the coal-tar rosin paints.

#### Method of Experimental Tests

The procedure in preliminary testing of an individual coating or combination of anticorrosive and antifouling coatings has been to select a steel panel of convenient size, say 24 inches by 24 inches, which has been thoroughly sandblasted and wire brushed to remove all rust and mill scale. The panel is divided in half longitudinally. On the left half are applied two coats of anticorrosive paint followed by one coat of antifouling paint to be tested. On the right half are applied in the same manner coats of standard bottom paints to serve as controls in evaluating the test paint. The panel is then submerged preferably just prior to the season of greatest fouling by means of rope suspension and galvanized sister hooks. Periodic observations are made to determine the extent of fouling and in this way the paint is evaluated.

Inspection of experimental paints whether on sections of bottoms or on panels are so reported that comparisons may be readily drawn. The reports are under three headings, viz: Fouling, corrosion, and film. Under

fouling is a brief description of the type, size and extent of fouling. Under corrosion is a brief description of the type and extent of corrosion. Under film is a description of defects such as flaking, blisters, anti-fouling, falling off of the anticorrosive paint, etc. The terms "non", "slight," "moderate," "considerable" and "heavy" are used to express the extents of fouling and corrosion. The terms "excellent," "good," "fair," "poor" and "bad" express the film condition.

In addition to these terms, merit grades based on 100 being perfect are assigned to the conditions of fouling, corrosion and film and are especially helpful when slight conditions are indicated. A typical inspection report would be: "Fouling: moderate, scattered barnacles one-fourth inch diameter and ascidians, grade 60"; "Corrosion: slight, fine rust over entire area, grade 78"; "Film: good, small blisters, some broken and exposing the anticorrosive paint, grade 75."

Applying the above specifically to the coal-tar rosin paints, repeated panel exposure tests at Beaufort and elsewhere indicated results of practically no fouling, slight corrosion, film good at the end of four months; slight fouling and corrosion at the end of ten months; heavy fouling and moderate corrosion, film good at the end of 16 months. These results were obtained in the summer of 1924 and subsequently the Norfolk navy yard was authorized to manufacture the paints to apply to a number of naval vessels. The tests on the bottoms of these vessels confirmed in general the preliminary panel tests.

Quite a few years ago, the director of the fish aquarium at Bermuda observed that bait boxes coated with paints of different colors exhibited marked differences in their degree of fouling, the difference being in favor of light color. This observation was applied to ship-bottom paints and a series of paints in various colors ranging from black to white were exposed at Beaufort and elsewhere.

After a few months it was found that the white and lighter colors were much less fouled than the dark paints. In order to further confirm these results, which would have an important bearing on the formulation of ship bottom paints, subsequent tests of light and dark-colored paints simultaneously applied to portions of hulls of naval vessels were made, with results that were somewhat disappointing and inconclusive. It appeared that while the light colored paints might offer greater resistance to fouling attaching in the early stages, other effects such as deterioration of film, left no choice between light and dark-colored paints.

(To be Continued in August)



# Arc Welding for Ship Construction

## And Development of Sound Practice

By J. F. King and J. Montgomerie\*

**D**URING the past fifteen years, which may be said to cover the history of electric welding as applied to ships, little progress has been made towards the stage where welding may be considered as a serious rival to riveting. The classification societies during that period have been willing to accept electric welding in the main structure of a vessel subject to being satisfied as to the strength and quality of the welding provided, but with one exception no considerable application to sea-going ships has been made in this country. It is probably safe to assume that cost has been the primary reason for this, and delay has been helped by a certain amount of passive resistance induced by a doubt, held in many quarters, as to the possibility of sound, strong, and reliable electric welding being obtained in shipyards under shipyard conditions.

Electric welding in ordinary practice is no more than melting the material in an electrode and in the material joined, by striking an electric arc between them. The difference between the joined material and the material of the joint may be likened to the difference between rolled steel and cast steel which has not been submitted to heat treatment. The heat generated at the joint ranges from melting point to normal temperature at some distance from the joint and, apart from unavoidable contraction strains, there are possible dangers to the structure of the steel on this account, while the contraction of the fused material in its passage from a fluid to a solid state has to be added to these temperature effects. It can be said that the difficulties inherent in this process have not encouraged shipbuilders to embark on its extended use, and it is during quite recent times that reports of the amount of electric welding that is being done in Germany and in the United States, especially that which has been applied to the construction of ships, have directed attention anew to this matter.

In a paper read last year before

\*Abstract of paper, on *Electric Arc Welding in Ship Construction*, by J. Foster King, C.B.E. vice president and James Montgomerie, D.Sc. member of council, read at the spring meeting of the seventy-third session of the Institution of Naval Architects, March 16, 1932.

the Institution of Engineers and Shipbuilders in Scotland, G. Wahl, of the Deutsche Werke, gave some of his experience in connection with the construction of two 133-foot oil barges which were 10 feet shorter, 30 per cent lighter, and were stated to have cost 11 per cent per ton deadweight less than a riveted ship, as a consequence of having been electrically welded.

### Welding On Two Large Vessels

There are also the cases of two large vessels now being built in Germany for the Hamburg-America line, in which electric welding is being

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## Conclusions on Welding

We have come to the conclusion that electric arc welding has reached a stage of development, both in regard to the composition of the electrodes and our knowledge of the methods which ensure good work, where conditions can be specified which permit of its use in the more important parts of the structure of a ship.

Experience of a new technique is a necessary prelude to its general adoption. Fortunately, there are in every ship many parts not subject to important strains, the application of electric welding to which will provide ample scope for the training of personnel, and for the development of sound practice in regard to the design of joints, the layout of the work, and its erection; as well as for the creation of a really thorough system of inspection. If these opportunities be utilized, a future which includes a general application of electric welding to ship construction can be regarded with confidence.

The Authors

extensively employed. The electrode used is a bare wire electrode, and the parts welded include:

The butts of the tank top plating; the seams of the tank top being riveted.

The attachment of the intercostals in the tank to the floors, and various other connections inside the double-bottom tanks.

The butts of deck plating, excluding the strength deck.

The various parts of pillars and girders, with the exception of the attachment of the girder to the deck.

Auxiliary engine seatings.

Main engine seatings, so far as the attachment to the tank top is concerned.

Oiltight bulkheads where the oil tanks are separated from the cargo by a cofferdam.

The attachments of the tank side brackets to the margin plate, and of the gusset plates to the margin plate.

Welding has also been largely used in the construction of casings and deckhouses. It is stated that a saving of 4 per cent has been made in the steel weight of each of these vessels without any increased cost on account of the welding itself.

Such facts do suggest that electric welding as a commercial proposition should engage the serious attention of shipbuilders and others in this country, and should provide the necessary stimulus for general and careful consideration of conditions under which it could be used in shipyards with satisfactory results.

Attention was probably first drawn to the possibility of an extended use of electric arc welding in ship construction by the experiments carried out in 1918 by Sir Westcott S. Abell, and described in a paper presented to the Institution of Civil Engineers in 1919.

Since that time a good deal of experimental investigation has been made on this subject, and a corresponding amount of practical experience gained in the application of the arc welding process. What follows is a statement of the results of that experimental work, and of that experience.

Approximately twenty different types of electrodes proposed to be used for ship construction have been tested in the interval between 1919 and 1931. The tensile tests gave



results ranging from 85 per cent to 100 per cent of the ultimate strength of the steel plate. The modulus of elasticity of the deposited material was found to correspond closely to that of steel, the mean value being, in fact, 12,500 tons per square inch. Alternating stress tests showed that the maximum stress at which the samples withstood 5 million alternations without fracture varied from 6.2 to 10.2 tons per square inch. A typical chemical analysis of deposited metal is as follows:

|                  | Electrode Deposit |       |
|------------------|-------------------|-------|
| Carbon .....     | 0.187             | 0.087 |
| Manganese .....  | 0.332             | 0.204 |
| Silicon .....    | 0.171             | 0.007 |
| Sulphur .....    | 0.035             | 0.038 |
| Phosphorus ..... | 0.009             | 0.019 |

A most important test from the point of view of a classification society is that which determines the tensile strength and elongation of the deposited metal alone. So far as the former is concerned, it varied from 23 tons per square inch to 31 tons per square inch. The elongation, however, which may be regarded as in some degree a measure of the ductility of the material, showed a wider variation in range. On 8-inch it varied from 2 per cent to 17 per cent, and this result is significant in view of the remarks which are to be found in another part of this paper.

In a recent series of tests carried out in Germany on wholly deposited material from electrodes of seven different types, the percentage of elongation on 8-inch varied from 2 per cent to 7.5 per cent, and the tensile strength varied between 16.9 and 23 tons per square inch.

Tests carried out in British yards during recent months have shown that with good electrodes and satisfactory conditions of control, weld material can be deposited which regularly shows 25 tons tensile strength or more, and an elongation of 16 per cent to 18 per cent or more.

#### Results from All Welded Ship

It is thought that it will be of interest to make a fairly complete statement in regard to the experience gained in the electrically welded vessel *FULLAGAR* (now named *SHEAN*). This vessel, as is well known, was constructed by Cammell, Laird & Co. in 1920, and was a valid, full-scale experiment in electric welding, because of the fact that no rivets whatever were used in the construction. It has been possible to maintain a constant supervision over this ship since she was built, by means of surveys which have been held annually. In the early part of her life she carried steel plates from South Wales to Liverpool. Later she has been engaged in coasting service in British Columbia, carrying cargoes of cement. Circumstances have combined to make her

experience as comprehensive as possible.

In 1924, she grounded on a sand-bank in the River Mersey, and the damage sustained was so severe that the underwriters agreed a total loss. In October 1930 she charged a rock at full speed, inflicting severe damage to her bow. Eighteen surveys in all have been held on this vessel, and the result of all this experience is broadly this: First, on only one occasion prior to damage has any welding required to be renewed; second, the corrosion observable on the welded material has not been more marked than on the surrounding plating; and third, when the damage above referred to was repaired, it was found that the welding was apparently performing its function effectively as a connecting medium. As against all this, it is necessary to remember that the work was done under the most favorable conditions, by experienced operators of the highest degree of expertness, and great care was taken to ensure satisfactory results. The conditions were therefore not quite analogous to ordinary shipyard practice.

Although it is true that electric welding has not been frequently applied to large portions of a vessel's structure, yet it has been employed to such an extent as to enable the classification societies to accumulate a considerable store of experience. This experience tends to show that satisfactory welding can be carried out today. In the case of repairs by electric welding, however, where the deposition of a large amount of material is required, as, for example, in repairs to stern frames, a good deal of subsequent attention may be necessary.

A good deal has been said and written about the corrosion which might possibly occur in the weld metal and in the neighborhood of the weld. Inquiries have revealed the fact that corrosion in the deposited metal of the weld often occurs when the surface has been left rough, but in other circumstances the degree of corrosion found there does not differ appreciably from that found in the surrounding material.

As has been pointed out, there are possible dangers to the structure of steel, due to the temperature of the work, as distinguished from unavoidable contraction strains, and in some cases it has been found that fractures have developed in the parent metal in the vicinity of a weld which has been well made and which adheres satisfactorily.

#### Quality of Workmanship and Material

All that we have learned of electric welding during the past fifteen years leads to the conclusion that the efficiency of the weld depends upon the welder, the ductility and quality of the deposited metal, the

design of the work, and the method of doing the work. Regulations framed by classification societies, therefore, must be based upon a consideration of these factors.

The quality of the deposited metal depends largely upon the materials used in the manufacture of the electrode, and in recent years considerable attention has been directed to the composition of electrodes, so that substantial progress is to be recorded. In the early days it was thought that to obtain a ductile weld, a very mild steel rod—one that would produce a deposit of metal nearly free from carbon and manganese—was the chief requirement. Indeed, some of the earlier investigators published analyses of deposited metal in which the carbon had for all practical purposes disappeared, and the content of manganese was reduced to a much lower figure than is demanded by good steel-making practice. Welds of this character might be satisfactory under static loads, but, for reasons well understood by the metallurgist, were invariably deficient in those properties of resistance to shock and capacity for plastic deformation, which are typical of the mild steels of commerce, and such welds on many occasions proved to be definitely unsound and porous. Recent developments have been towards the production of a deposit possessing chemical and physical properties which approach those of the material to be joined. It is now possible to obtain a much greater degree of ductility in deposited metal, a fact which in itself is a sufficient justification for considering the matter anew from the point of view of employing the process for parts of primary structural importance.

There are a few skilled operators whose practical and technical knowledge and skill in handling their tools enable them to make a perfect weld for any class of material of which they have experience. That there will ever be a sufficient supply of such highly skilled operators to carry on electric welding as a large-scale commercial proposition is extremely doubtful, and it is certainly not available at present. It therefore becomes necessary to immediate development that methods shall be devised whereby operators of ordinary skill, working under shipyard conditions, shall be able to produce the quality of work which is essential to a sound job. As a means to that end, it seems essential that every operator should realize that he is melting and depositing another metal upon a molten surface, and that the physical properties of the resulting joint should resemble those of the material joined as much as possible. He should have sufficient knowledge of electrical plant to be able to carry out, accurately,

(Continued on Page 44)



# New Canadian Hydrographic Vessel

## For Service on the Pacific Coast

**T**HE twin screw steamer Wm. J. STEWART, specially designed and built for the Dominion government hydrographic service for use on the Pacific coast, cleared on June 5 from the yard of her builder, the Collingwood Shipyards Ltd., Collingwood, Ont., on her 8000-mile voyage to Victoria, B. C.

The new vessel was launched on April 14. Measured mile trials were carried out on May 18 and the ten hours endurance trials on May 19. Maximum speed attained on the measured mile was 13.59 knots at 1595 revolutions; something over  $1\frac{1}{2}$  knots above the specified speed. On the progressive speed trials 12 knots was attained at 142 revolutions; 11 knots at 125.5 revolutions; 9.59 knots at 108.7 revolutions; and 8.25 knots at 90.2 revolutions. During the 10-hour endurance trial the STEWART averaged 12.7 knots at 145 revolutions per minute.

While under construction and during the trials the Canadian department of marine was represented by Charles F. M. Duguid, naval constructor of the department. John S. Leitch, vice president and general manager of the Collingwood Shipyards Ltd., represented the builder. The contract required the delivery of the new ship by the builder to the department at Victoria, B. C.

### Cruiser Stern, Raked Stem

The STEWART has a cruiser stern and a slightly raked stem and conforms throughout to the special survey

of the British Corporation Register of Shipping and Aircraft and also to the requirements of the Canadian government steamboat inspection. The general dimensions are: Length overall 228 feet; length between perpendiculars, 214 feet; breadth molded, 36 feet and depth molded, 23 feet 6 inches. Fore and aft the hull is subdivided by 9 watertight bulkheads. There are four decks, lower, main, upper and boat decks.

Special attention has been given to the quarters for the surveying staff and accommodations are fitted for a complement of 66. Quarters for the officer commanding consist of a day cabin paneled in mahogany and a sleeping cabin paneled in oak fitted with a nickel-plated cot. A special bathroom adjoins the sleeping cabin. Four large well-furnished staterooms located on the main deck will serve as quarters for surveyors. In conjunction with these rooms are two bathrooms and three water closets. An additional group of four large staterooms also for the use of surveyors is located on the lower deck. This group is served by one bathroom.

On the upper deck is a smoking room paneled in fumed oak and there is also on this deck a special office for the officer commanding. The staff dining saloon, paneled in oak, is situated on the main deck. In addition there is also an officers' saloon and petty officers mess on the main deck aft.

To complete the accommodation for the surveyors' staff, quarters have

been arranged for four drivers and four coxswains. Sixteen seamen and 6 firemen are berthed aft. There are also special rooms for two trimmers, three oilers and three quartermasters.

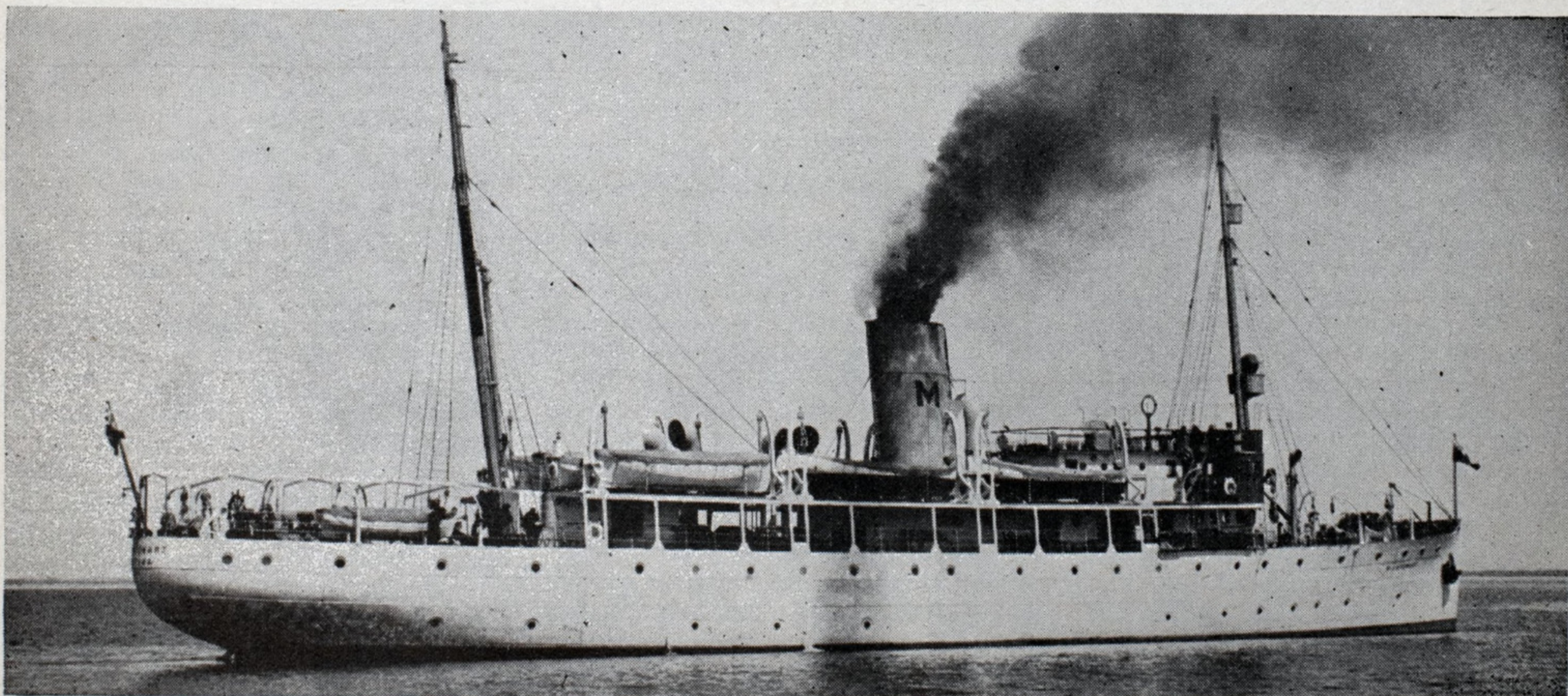
Deck officers and engineers have special bathrooms. The chief, second and third engineers each have separate rooms. The chief's room is paneled in mahogany and the second and third engineers rooms are paneled and enameled white. The chief steward also has a room paneled and enameled white. On the lower deck forward separate rooms are provided for carpenter, boatswain, two cooks and four stewards. On this deck there is also a large day room for the use of these men.

### Large Refrigerated Stores Space

The galley is located amidships and is equipped with a large range, baking oven and a complete outfit to take care of the entire crew. A pantry is fitted for the officers and one for the staff. In the after 'tween decks a large refrigerating space is divided into separate rooms for vegetables, butter, meat and fish. The saloon pantry is equipped with an electric Kelvinator refrigerator.

On the main deck is located a fully equipped laundry for general use. Lavatory accommodation for seamen and firemen is arranged aft on the main deck.

Under the forecastle is fitted a carpenter shop, carpenters' stores, lamp room and stores for gasoline launch gear. The forward hold is arranged



*Twin Screw Steamer Wm. J. Stewart for the Canadian Hydrographic Service built by Collingwood Shipyards Ltd.*



for boatswain stores, rope and canvas stores. The after 'tween decks have been arranged for stores, canned goods and other supplies.

Special attention has been given to the fittings and upholstery in all the accommodations and everything is of first class quality. The 'tween decks have been laid with corticene cemented to the deck and secured with metal strips. The upper and boat deck and flying bridge are sheathed with British Columbia fir.

On the upper deck is located a special chart room paneled in oak and fitted with Styne's sliding windows, two chart tables, 10 feet long by 6 feet wide and 3 feet 2 inches high, for the preparation of charts. Indirect lighting is provided and the floor is covered with rubber tiling.

An unusually large number of small boats is carried, 14 in all, two 25-foot lifeboats, one 20-foot dinghy, three 16-foot dinghies, four 18-foot dories and four 26-foot gasoline launches. These launches are especially designed and equipped for hydrographic survey work. The launches and lifeboats are carried under Welin MacLachlan davits on the boat deck. Ordinary davits are provided for the other boats with the exception of the dories.

#### Compass Equipment Complete

As might be expected, unusual care has been given to the compass equipment. A master gyro compass is installed in a special room on the lower deck and five repeaters are arranged throughout the ship. In addition there is a standard magnetic compass on the flying bridge, a steering compass in the wheelhouse and a compass aft. In connection with the gyro compass, a course recorder, motor generator, alarm units and control panel are also fitted.

Watertight compartments have been arranged in the bottom of the ship and wiring and all connections have been provided for the fitting of an echo depth finding apparatus.

A complete wireless installation has been installed including aials, main transmitter, long wave receiver, radio telephone transmitter and receiver, two radio telephone portable equipments, direction finder and broadcast receivers. A complete system of loud speaking telephones has been installed. A powerful Sperry searchlight is fitted on the foremast.

The lower navigating bridge is enclosed with wind shelters fitted with sliding lights. Two electrically driven Kent clear-view screens are installed, one on each side of the shelters and one in front of the wheelhouse.

A complete system of ventilation has been fitted throughout the ship. In addition, supply and exhaust fan ventilation has been supplied for the accommodations and for the engine room. Steam heating is provided for all quarters throughout the vessel.

The sanitary system is in accordance with the latest modern practice. Hot and cold salt water is supplied to the bathrooms; fresh water to the showers and hot and cold fresh water to the various lavatories.

Deck auxiliaries consist of a powerful windlass, a capstan aft and a boat hoisting winch on the boat deck. There is a steam sounding pony aft, also electrically operated sounding machines. The steam steering gear is of the vertical type located on the after engine room bulkhead with shafting led aft to left and right hand screw gear and aft to the rudder head.

#### Ample Electrical Capacity

Electric lighting is provided throughout. The generating sets are in duplicate. Each dynamo is of direct current, compound wound, open protected type of 20 kilowatts capacity at 110 volts pressure, di-

### Great Lakes Red Book

*THE Great Lakes Red Book, vest-pocket directory giving the names of owners, operators, vessels and where appointments have been made, captains and engineers of all shipping on the Great Lakes, is out for the year 1932 in its twenty-ninth annual edition. The Red Book is published each year at Cleveland by MARINE REVIEW under the direction of A. H. Jansson, editor.*

*The 1932 edition of the Red Book lists over 1500 vessels of the Great Lakes. There is also a complete directory of the shipbuilding and ship repair yards on the Great Lakes. This directory gives the names of all principal officers and the drydock, repair and building facilities at each yard.*

*Individual vessels and fleets are alphabetically arranged. The capacities of all ore carriers are given and there is also a complete port directory.*

rect connected to a vertical, single cylinder, enclosed type steam engine. All wiring is on the double wire system, wires being run openly. An emergency generating set driven by a diesel engine is located in the deck house on the upper deck. A complete system of electric bells and fans is installed.

#### Propelling Machinery and Boilers

The propelling engines and the boilers were built by the Collingwood Shipyards Ltd. The propelling machinery consists of two sets of triple expansion engines having cylinders 13½ x 20½ x 33 inches in diameter and 24 inches stroke. Each engine has a separate condenser.

Steam is supplied by two single-ended scotch boilers 13 feet in diameter and 11 feet 2 inches long working at 100 pounds pressure with Howden's forced draft. These boilers are fitted one ahead of the other. Coal bunkers are arranged at the sides. Coaling is done through saddle back coal hatches on the upper deck, also eight coal scuttles.

The thrust bearings are of Michell make. Cutless rubber bearings have been fitted to the propeller struts.

Auxiliaries consist of two main air pumps, three feed pumps, feed water heater, feed water filter, evaporator, distiller, one emergency bilge pump, two centrifugal circulating pumps, one ballast and general service pump, one sanitary pump and one fresh water pump. An elaborate work shop has been fitted at the after end of the engine room and is equipped with a number of electric motor driven tools.

### New Orleans Traffic Grows

The movement of shipping at New Orleans in May, 1932, increased over the movement for the same month of 1931, according to figures released by board of commissioners of the Port of New Orleans. During the month, 220 seagoing vessels arrived, an increase of 8 vessels. There were 214 departures. The vessels arriving from sea had a total gross tonnage of 915,971 tons, an increase of 85,909 tons. Vessels using the public wharves aggregated 716,415 tons, an increase of 18,484 tons. Cargo paying tollage amounted to 245,948 tons.

Substantial increases were recorded by many classes of freight moving over the wharves. Among the imports, wood and paper increased 3879 tons; textiles increased 3822 tons and miscellaneous freight increased 2197 tons. Among the exports textiles increased 19,056 tons, vegetable food products increased 14,663 tons and ores, metals and their manufactures increased 5172 tons.

The inner harbor navigation canal, connecting the Mississippi river and Lake Pontchartrain, showed its usual activity. During the month 1175 vessels, having a total gross tonnage of 457,716 tons used the canal.

An increase was also recorded in the movement of inland watercraft. During the month 335 of such vessels, having a total tonnage of 120,330 tons arrived in port. This was an increase of 3765 tons.

Succeeding the late Rear Admiral Billard, Capt. Harry G. Hamlet has been sworn in as commandant of the coast guard with the rank of rear admiral. Captain Hamlet has been in the coast guard since 1894. As an ensign he was assigned to the cutter BEAR during the Arctic relief expedition in 1897.



## British Shipping Magnate, Earl of Inchcape Dies

ONE of Great Britain's leading shipping men, James Lyle Mackay, Earl of Inchcape, died May 23, at the age of 79. He had been ill for some time and died while on board his yacht, the ROVER, lying off Monte Carlo. Death was due to a sudden heart attack. He was the chairman and managing director of the famous P & O and British Steam Navigation companies. He began his steamship experience in his early youth, after having been left an orphan at the age of 12. The first company he was associated with was Mackinnon-Mackenzie & Co., managing agents of the British India Co. and with important connections in India and the East. In but a



few years Mackay made a reputation for himself for his energy and enthusiasm and was transferred to Bombay where he reorganized that branch of the parent company. He was made a partner at the age of 27. From then on his record was one of constantly increasing responsibility until long since he became perhaps the most outstanding figure in British shipping.

One of his outstanding achievements was the manner in which he handled the disposal of the tremendous volumes of material left over after the war. Taking over all the government ships, he was able to sell them to individuals and to companies for a total of £35,000,000. He would not accept any remuneration from the government. Following his brilliant handling of the government's ships, he successfully disposed of 418 enemy ships and accepted a risk of £20,000,000 to do so. Later he similarly sold war craft and prize vessels.

All through his life, though dealing with the largest of shipping enterprises involving millions of dollars, he was an energetic and insistent advocate of economy in national and private expenditures. He was knighted in 1894 and in 1911 he was elevated to the peerage as Baron Inchcape a name he took from the famous rock near his birthplace at Arbroath.

One of the characteristics for which he was famous was the plain talk invariably associated with his speeches at the annual meetings of the Peninsula and Oriental Steam Navigation Co. These speeches always commanded the keenest attention and usually received the approval of his listeners. He was director of 31 companies.

## Dollar Becomes President

AT A directors meeting of United States Lines Co. of Nevada, late in May at San Francisco, R. Stanley Dollar, president of the Dollar line, was elected president to succeed William F. Humphrey, who remains a director. Participating in the San Francisco meeting were R. Stanley Dollar, Herbert Fleishhacker, Kenneth D. Dawson, Kermit Roosevelt, John M. Franklin and Cletus Keating, counsel for the Roosevelt Steamship Co.

The election of Mr. Dollar as president is in line with the plan of organization in joining the interests of the Dollar, Dawson and Roosevelt I. M. M. in ownership of the United States lines. In becoming head of the United States lines, Mr. Dollar is now one of the outstanding shipping leaders in the world. The North Atlantic fleet, together with the Dollar round-the-world, transpacific, Manila and inter-coastal services, form one of the greatest fleets afloat. Furthermore all of these vessels are under the American flag and include the world famous LEVIATHAN, the new transatlantic liner MANHATTAN to enter service in August, and the palatial new Dollar liners, PRESIDENT HOOVER and PRESIDENT COOLIDGE.

The active management and operation of the United States lines will continue, as heretofore, in the hands of the Roosevelt Steamship Co., which has been acting as managing agent of the service since last fall. P. A. S. Franklin, president of the International Mercantile Marine is chairman of the board of the Roosevelt company. Kermit Roosevelt is president and Basil Harris, John M. Franklin, P. V. G. Mitchell and A. C. Fetterolf are vice presidents.

It is interesting to note that the business of the United States lines so far this year is considerably in excess of last year. Particularly the tourist and third class show a marked increase and on the LEVIATHAN's second voyage were sold out. The first class bookings are also reported as good.

## Eighty-fifth Anniversary Hamburg-American

DESERVEDLY one of the world's great steamship lines, the Hamburg-American, or "Hapag" to use the initials of its full German designation, on May 27, celebrated the eighty-fifth anniversary of its founding. On May 27 in the year 1847 a group of Hamburg merchants subscribed 450,000 marks for founding a stock company, "to establish regular communication between Hamburg and North America by means of sailing ships flying the Hamburg flag." In pursuance of this policy the full rigged clipper DEUTSCHLAND started on her maiden voyage across the Atlantic on Oct. 15, 1848. Berths for each passenger's exclusive use was one of the luxuries offered on this first liner. Ninety passengers sailed on this first voyage and reached New York on the fortieth day.

The growth of the line was steady, but the real beginning of its rise to greatness came in 1886 when Albert Ballin joined the company. His foresight, untiring energy and genius as an organizer were largely responsible for the phenomenal growth of the line.

When the World war broke out the Hamburg-American line owned 439 vessels of 1,360,360 gross tons, 194 of which were ocean steamers. With this fleet the line maintained 75 regular overseas routes, serving more than 400 of the most important ports of Europe, America, Asia and Africa. In number and tonnage of ships it was the largest private steamship enterprise in the world. In 1913 the line transported, on 2218 ocean voyages, 8,300,000 tons of freight and 464,000 passengers.

The World war practically destroyed this giant structure. Only a few small boats were left for trading on short trips in the North sea and the Baltic. In April, 1920 the Scandinavian steamer GRIMM, of 1439 gross tons, was purchased, again making it possible for the line to show its house flag overseas. Then came the well-known agreement with the New York Harri-man concern and the re-opening of a weekly service to New York.

German shipping companies were compensated by their government for war losses to the extent that the Hamburg-American line was able to replace about one-third of its pre-war fleet. New building commenced. The steamers BAYERN and WUERTTENBERG arrived in the Port of New York followed by the rebuilt former express steamer DEUTSCHLAND, renamed the HANSA, the CLEVELAND, and, in 1922, by the palatial RESOLUTE and RELIANCE bought from their Holland owner.

Addition of the four sister ships, ALBERT BALLIN, DEUTSCHLAND, HAMBURG and NEW YORK, each of 21,000 tons and the motor vessels MILWAUKEE and ST. LOUIS temporarily completed the rebuilding program.



# Late Decisions in Maritime Law

## Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review

By Harry Bowne Skillman

Attorney at Law

**S**TATUTE requiring the owner to mark a sunken vessel with a buoy or beacon during the day and a lighted lantern at night is mandatory and imposes on the owner a nondelegable personal duty.—*SNUG HARBOR*, 53 F. (2d) 407.

\* \* \*

**C**HARGES of taxicab for conveying provisions to a yacht for use of the crew constitute a maritime lien, as do items for storing the yacht's equipment, sails and small boats during the winter, and recharging of batteries at regular intervals to save them from deterioration.—*ARTEMIS*, 53 F. (2d) 672.

\* \* \*

**A**CKNOWLEDGMENT in a bill of lading that raw linseed was shipped in good order and condition established a prima facie case for a shipper suing for damage by sea water, and proof of a storm alone is not sufficient to establish that the damage was caused by a peril of the sea.—*LASSELL*, 53 F. (2d) 687.

\* \* \*

**L**EADING text-writers on admiralty law and Supreme Court decisions agree that, in general, where a bill of lading is silent, the contract of affreightment carries with it the carrier's duty to deliver the cargo "safely," and that freight is collectible only on delivery of the merchandise to the consignee. Any contradiction between a prior written contract and bills of lading must be resolved in favor of the former, unless the parties clearly intended the latter should constitute a new contract. Bills of lading should be construed strictly against the carrier and the courts should look to all attendant circumstances in construing the carrier's contract.—*Toyo Kisen Kaisha v. W. R. Grace & Co.*, 53 F. (2d) 740.

\* \* \*

**A**DMIRALTY jurisdiction is not suspended, as to vessels engaged in maritime commerce on the Great Lakes, during the part of the year that navigation is closed. Where a vessel under contract of carriage transports a cargo from one port to another and holds such cargo pending delivery at the opening of the next season, it is not thereby excluded from the benefits of the limitation of liability sta-

tutes. The character of the service and liability of the owner may be temporarily altered, but the vessel remains a capable instrument of maritime commerce.—*In re Great Lakes Transit Corp.*, 53 F. (2d) 1022.

\* \* \*

**W**HERE there are no docks at the port of discharge (in this case, Port Said), and it is the custom to discharge cargoes by lighters, it reasonably follows, said the court in *Continental Insurance Co. v. Anchor line*, 53 F. (2d) 1032, that the contract of carriage contemplated the discharge of the cargo by lighters. Whether the owner of the lighters are private or common carriers, it was declared, does not relieve them from the responsibility of furnishing a seaworthy lighter, and the unexpected sinking of a lighter used raises a presumption of unseaworthiness.

\* \* \*

**I**N CONSIDERING the matter of maritime liens, in the case of *PACIFIC HEMLOCK*, 53 F. (2d) 492, the court said: "The ship was liable to safely deliver the cargo, and the cargo was liable to the ship for carriage. There was a reciprocal pledge for service and compensation between the ship and the cargo. The lien of the cargo owner is limited by the corresponding and reciprocal right of the shipowner upon the cargo. \* \* \* the liability of the ship for transportation and the liability of the cargo for affreightment do not differ in their nature and legal effect. The ship has a personality of her own, is competent to contract, is liable for her obligations and her torts. The cargo, as well, has a similar status, and, after the cargo is delivered, all claim of the ship on the cargo is ended \* \* \*. A maritime lien can be effected only by some visible contact with, or occurrence relating to, the service of the ship, and must be a manifest and open, ocular, physical endeavor of maritime service which may serve as notice to the world of an existing claim. \* \* \* The principle of hypothecation is the basis of a maritime lien, and the hypothecation cannot apply upon secret agreements between the owners, \* \* \* for repayment of freight on certain contingencies and after ending of reciprocal relation between ship and cargo. The period of reciprocal relation be-

tween ship and cargo is from beginning and ending of the voyage—the receipt of cargo and the delivery of cargo. Any status or relation ante or post maritime service on a separable stipulation is nonmaritime. Admiralty has no jurisdiction for repayment of carriage charges on the separable contract \* \* \* on a contingent agreement between owners of ship and owners of cargo."

\* \* \*

**G**ENERALLY speaking, the workmen's compensation law of a state will be held to apply to an injury even though it occur on navigable water, if the unemployment out of which it arose is a matter of purely local concern and works no material prejudice to the general maritime law. The loading of a ship is exclusively of maritime character and not of purely local concern. In the instant case of *L'Hote v. Crowell*, 54 F. (2d) 212, a longshoreman had finished his work on the wharf and from the time he was lifted from it by a sling by means of the ship's tackle was under the control of an instrumentality of the ship; his situation was the same as it would have been had he been physically on board the ship. The fact that he was negligent in riding the sling, instead of using the gangway, does not preclude recovery for his death, as the law which by its terms is to be liberally construed provides that "compensation shall be payable irrespective of fault as a cause for the injury."

\* \* \*

**O**NE may have a valid maritime lien for furnishing labor, repairs, and supplies to a vessel to enable her to go to sea, and the enforcement of such lien by an innocent lienor, against the vessel or her proceeds, is not precluded, according to the case of *Jackman v. United States*, 54 F. (2d) 227, because she later subjects herself to forfeiture for a violation of law.

\* \* \*

**W**HERE goods, admitted to have been received in apparent good condition, were delivered damaged after the voyage, the burden is on the carrier to show that the damage was occasioned by one of the perils or causes for which it was not responsible.—*AFRICA MARU*, 54 F. (2d) 265.



# Marine Business Statistics Condensed

## Record of Traffic at Principal American Ports for Past Year

### New York

| (Exclusive of Domestic) |             |           |              |           |
|-------------------------|-------------|-----------|--------------|-----------|
| Month                   | —Entrances— |           | —Clearances— |           |
|                         | No.         | Net       | No.          | Net       |
| ships                   | tonnage     | ships     | tonnage      |           |
| May, 1932               | 277         | 1,484,116 | 259          | 1,392,451 |
| April                   | 270         | 1,506,696 | 277          | 1,515,147 |
| March                   | 332         | 1,982,670 | 375          | 2,070,546 |
| February                | 312         | 1,875,981 | 322          | 1,776,394 |
| January                 | 297         | 1,821,335 | 305          | 1,719,978 |
| December                | 314         | 1,692,258 | 343          | 1,744,190 |
| November                | 304         | 1,564,284 | 308          | 1,542,849 |
| October                 | 309         | 1,626,094 | 322          | 1,708,560 |
| September               | 523         | 2,724,761 | 522          | 2,641,711 |
| August, 1931            | 541         | 2,785,703 | 531          | 2,739,919 |

### Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)  
(Exclusive of Domestic)

| Month        | —Entrances— |         | —Clearances— |         |
|--------------|-------------|---------|--------------|---------|
|              | No.         | Net     | No.          | Net     |
| ships        | tonnage     | ships   | tonnage      |         |
| May, 1932    | 66          | 205,184 | 46           | 142,889 |
| April        | 55          | 165,646 | 51           | 159,427 |
| March        | 57          | 186,479 | 45           | 151,190 |
| February     | 49          | 150,899 | 34           | 98,667  |
| January      | 51          | 168,266 | 36           | 114,982 |
| December     | 58          | 180,172 | 42           | 132,734 |
| November     | 52          | 148,335 | 37           | 111,969 |
| October      | 69          | 192,159 | 57           | 160,609 |
| September    | 66          | 172,313 | 54           | 155,113 |
| August, 1931 | 81          | 208,854 | 59           | 147,948 |

### Boston

(Exclusive of Domestic)

| Month        | —Entrances— |         | —Clearances— |         |
|--------------|-------------|---------|--------------|---------|
|              | No.         | Net     | No.          | Net     |
| ships        | tonnage     | ships   | tonnage      |         |
| May, 1932    | 125         | 294,093 | 97           | 257,608 |
| April        | 103         | 308,951 | 72           | 215,237 |
| March        | 99          | 319,863 | 65           | 217,992 |
| February     | 107         | 315,036 | 63           | 213,166 |
| January      | 94          | 286,508 | 61           | 208,491 |
| December     | 102         | 313,977 | 65           | 240,908 |
| November     | 75          | 241,142 | 52           | 166,786 |
| October      | 98          | 325,261 | 66           | 241,072 |
| September    | 109         | 339,482 | 78           | 263,783 |
| August, 1931 | 131         | 388,799 | 98           | 305,488 |

### Portland, Me.

(Exclusive of Domestic)

| Month        | —Entrances— |        | —Clearances— |        |
|--------------|-------------|--------|--------------|--------|
|              | No.         | Net    | No.          | Net    |
| ships        | tonnage     | ships  | tonnage      |        |
| May, 1932    | 14          | 26,484 | 14           | 29,669 |
| April        | 10          | 22,911 | 10           | 24,483 |
| March        | 14          | 41,083 | 13           | 35,993 |
| February     | 20          | 53,793 | 20           | 56,558 |
| January      | 13          | 28,179 | 14           | 28,955 |
| December     | 18          | 38,860 | 18           | 37,319 |
| November     | 17          | 40,991 | 19           | 47,514 |
| October      | 17          | 39,060 | 16           | 34,195 |
| September    | 27          | 48,534 | 26           | 52,035 |
| August, 1931 | 29          | 50,249 | 23           | 39,273 |

### Providence

(Exclusive of Domestic)

| Month        | —Entrances— |        | —Clearances— |        |
|--------------|-------------|--------|--------------|--------|
|              | No.         | Net    | No.          | Net    |
| ships        | tonnage     | ships  | tonnage      |        |
| May, 1932    | 7           | 24,204 | .....        | .....  |
| April        | 4           | 17,438 | 3            | 13,515 |
| March        | 8           | 35,293 | 5            | 24,289 |
| February     | 5           | 19,442 | 4            | 18,533 |
| January      | 8           | 41,147 | 4            | 21,654 |
| December     | 11          | 41,268 | 4            | 17,037 |
| November     | 9           | 35,826 | 5            | 18,040 |
| October      | 6           | 23,833 | 6            | 23,836 |
| September    | 6           | 20,330 | 3            | 11,160 |
| August, 1931 | 10          | 41,671 | 3            | 12,240 |

### Portland, Oreg.

(Exclusive of Domestic)

| Month        | —Entrances— |         | —Clearances— |         |
|--------------|-------------|---------|--------------|---------|
|              | No.         | Net     | No.          | Net     |
| ships        | tonnage     | ships   | tonnage      |         |
| May, 1932    | 20          | 82,750  | 25           | 99,862  |
| April        | 23          | 83,171  | 28           | 104,796 |
| March        | 26          | 103,924 | 36           | 142,050 |
| February     | 32          | 127,810 | 36           | 149,417 |
| January      | 27          | 112,542 | 42           | 168,762 |
| December     | 29          | 114,184 | 40           | 154,060 |
| November     | 26          | 103,835 | 47           | 182,585 |
| October      | 36          | 144,875 | 54           | 207,518 |
| September    | 32          | 126,256 | 49           | 199,803 |
| August, 1931 | 29          | 114,582 | 31           | 119,968 |

### Baltimore

(Exclusive of Domestic)

| Month        | —Entrances— |         | —Clearances— |         |
|--------------|-------------|---------|--------------|---------|
|              | No.         | Net     | No.          | Net     |
| ships        | tonnage     | ships   | tonnage      |         |
| May, 1932    | 95          | 289,042 | 102          | 317,751 |
| April        | 108         | 346,276 | 114          | 377,317 |
| March        | 96          | 288,052 | 105          | 319,511 |
| February     | 105         | 337,487 | 98           | 323,603 |
| January      | 95          | 301,958 | 102          | 328,876 |
| December     | 102         | 330,709 | 106          | 354,320 |
| November     | 99          | 304,138 | 98           | 314,109 |
| October      | 116         | 388,308 | 111          | 385,136 |
| September    | 111         | 350,556 | 117          | 362,970 |
| August, 1931 | 122         | 374,434 | 118          | 377,085 |

### Norfolk and Newport News

(Exclusive of Domestic)

| Month        | —Entrances— |        | —Clearances— |         |
|--------------|-------------|--------|--------------|---------|
|              | No.         | Net    | No.          | Net     |
| ships        | tonnage     | ships  | tonnage      |         |
| May, 1932    | 24          | 52,049 | 43           | 112,672 |
| April        | 22          | 59,932 | 33           | 77,515  |
| March        | 33          | 79,948 | 42           | 99,939  |
| February     | 22          | 68,136 | 48           | 121,647 |
| January      | 17          | 53,536 | 38           | 104,392 |
| December     | 30          | 95,762 | 38           | 110,614 |
| November     | 23          | 77,075 | 47           | 113,416 |
| October      | 25          | 76,385 | 54           | 146,995 |
| September    | 24          | 72,333 | 47           | 104,255 |
| August, 1931 | 21          | 59,408 | 54           | 127,864 |

### Jacksonville

(Exclusive of Domestic)

| Month        | —Entrances— |        | —Clearances— |        |
|--------------|-------------|--------|--------------|--------|
|              | No.         | Net    | No.          | Net    |
| ships        | tonnage     | ships  | tonnage      |        |
| May, 1932    | 12          | 33,157 | 8            | 20,489 |
| April        | 9           | 17,886 | 9            | 21,812 |
| March        | 8           | 15,560 | 13           | 26,457 |
| February     | 8           | 18,785 | 10           | 21,812 |
| January      | 8           | 26,601 | 12           | 27,759 |
| December     | 12          | 25,453 | 10           | 21,501 |
| November     | 6           | 14,295 | 8            | 22,180 |
| October      | 10          | 25,659 | 9            | 17,710 |
| September    | 6           | 12,463 | 8            | 18,888 |
| August, 1931 | 21          | 61,439 | 24           | 70,922 |

### Key West

(Exclusive of Domestic)

| Month        | —Entrances— |        | —Clearances— |        |
|--------------|-------------|--------|--------------|--------|
|              | No.         | Net    | No.          | Net    |
| ships        | tonnage     | ships  | tonnage      |        |
| May, 1932    | 56          | 76,236 | 55           | 76,070 |
| April        | 55          | 77,443 | 50           | 80,778 |
| March        | 41          | 61,078 | 39           | 59,069 |
| February     | 39          | 59,334 | 39           | 66,392 |
| January      | 43          | 67,913 | 42           | 71,873 |
| December     | 39          | 68,392 | 40           | 73,365 |
| November     | 40          | 53,752 | 42           | 53,497 |
| October      | 37          | 57,588 | 37           | 59,408 |
| September    | 36          | 54,012 | 35           | 55,610 |
| August, 1931 | 37          | 56,505 | 37           | 56,505 |

### Mobile

(Exclusive of Domestic)

| Month        | —Entrances— |         | —Clearances— |         |
|--------------|-------------|---------|--------------|---------|
|              | No.         | Net     | No.          | Net     |
| ships        | tonnage     | ships   | tonnage      |         |
| May, 1932    | 102         | 212,215 | 97           | 198,871 |
| April        | 102         | 192,617 | 104          | 202,965 |
| March        | 97          | 204,645 | 98           | 211,921 |
| February     | 101         | 235,846 | 96           | 219,215 |
| January      | 110         | 253,792 | 112          | 242,378 |
| December     | 98          | 226,656 | 85           | 214,395 |
| November     | 100         | 214,204 | 87           | 189,474 |
| October      | 118         | 251,661 | 112          | 253,721 |
| September    | 104         | 213,204 | 102          | 226,192 |
| August, 1931 | 113         | 217,541 | 97           | 194,678 |

### Seattle

(Exclusive of Domestic)

| Month        | —Entrances— |         | —Clearances— |         |
|--------------|-------------|---------|--------------|---------|
|              | No.         | Net     | No.          | Net     |
| ships        | tonnage     | ships   | tonnage      |         |
| May, 1932    | 43          | 184,393 | 41           | 170,652 |
| April        | 40          | 171,346 | 43           | 191,852 |
| March        | 43          | 190,082 | 43           | 180,862 |
| February     | 50          | 217,837 | 54           | 232,138 |
| January      | 48          | 200,281 | 50           | 216,819 |
| December     | 50          | 218,018 | 48           | 204,111 |
| November     | 48          | 209,655 | 50           | 215,614 |
| October      | 61          | 257,329 | 62           | 267,366 |
| September    | 52          | 229,687 | 50           | 217,517 |
| August, 1931 | 48          | 202,879 | 51           | 213,091 |

### New Orleans

(Exclusive of Domestic)

| Month        | —Entrances— |         | —Clearances— |         |
|--------------|-------------|---------|--------------|---------|
|              | No.         | Net     | No.          | Net     |
| ships        | tonnage     | ships   | tonnage      |         |
| May, 1932    | 182         | 517,523 | 169          | 472,154 |
| April        | 192         | 558,631 | 194          | 559,824 |
| March        | 200         | 604,269 | 196          | 589,805 |
| February     | 157         | 436,882 | 169          | 469,296 |
| January      | 171         | 516,707 | 171          | 506,411 |
| December     | 169         | 482,802 | 170          | 504,981 |
| November     | 173         | 498,800 | 169          | 483,099 |
| October      | 174         | 502,867 | 195          | 563,095 |
| September    | 171         | 474,876 | 179          | 508,560 |
| August, 1931 | 179         | 484,245 | 172          | 474,230 |

### Charleston

(Exclusive of Domestic)

| Month        | —Entrances— |         | —Clearances— |         |
|--------------|-------------|---------|--------------|---------|
|              | No.         | Net     | No.          | Net     |
| ships        | tonnage     | ships   | tonnage      |         |
| May, 1932    | 29          | 80,415  | 27           | 71,288  |
| April        | 21          | 53,404  | 21           | 57,341  |
| March        | 37          | 131,723 | 36           | 110,353 |
| February     | 32          | 88,616  | 27           | 75,262  |
| January      | 24          | 73,488  | 22           | 16,217  |
| December     | 37          | 108,083 | 35           | 96,490  |
| November     | 19          | 31,125  | 11           | 35,588  |
| October      | 20          | 49,738  | 22           | 55,371  |
| September    | 16          | 29,428  | 11           | 19,111  |
| August, 1931 | 9           | 18,293  | 7            | 6,274   |

### Galveston

(Exclusive of Domestic)

| Month        | —Entrances— |         | —Clearances— |         |
|--------------|-------------|---------|--------------|---------|
|              | No.         | Net     | No.          | Net     |
| ships        | tonnage     | ships   | tonnage      |         |
| May, 1932    | 38          | 84,468  | 86           | 259,026 |
| April        | 44          | 97,609  | 106          | 297,282 |
| March        | 32          | 61,079  | 109          | 319,013 |
| February     | 27          | 64,866  | 101          | 317,095 |
| January      | 26          | 73,215  | 92           | 292,274 |
| December     | 37          | 113,327 | 111          | 358,950 |
| November     | 33          | 81,906  | 101          | 328,883 |
| October      | 35          | 80,748  | 112          | 354,607 |
| September    | 27          | 63,896  | 99           | 320,127 |
| August, 1931 | 39          | 85,793  | 79           | 234,583 |

### Los Angeles

(Exclusive of Domestic)

| Month        | —Entrances— |         | —Clearances— |         |
|--------------|-------------|---------|--------------|---------|
|              | No.         | Net     | No.          | Net     |
| ships        | tonnage     | ships   | tonnage      |         |
| May, 1932    | .....       | .....   | .....        | .....   |
| April        | 189         | 617,325 | 222          | 635,301 |
| March        | 168         | 622,067 | 188          | 611,770 |
| February     | 164         | 627,876 | 158          | 622,730 |
| January      | 144         | 578,699 | 149          | 594,384 |
| December     | 153         | 517,165 | 136          | 506,985 |
| November     | 147         | 503,238 | 142          | 535,870 |
| October      | 215         | 720,162 | 193          | 678,776 |
| September    | 199         | 580,683 | 196          | 593,882 |
| August, 1931 | 199         | 673,223 | 204          | 676,036 |

### San Francisco

(Exclusive of Domestic)

| Month              | —Entrances— |         | —Clearances— |         |
|--------------------|-------------|---------|--------------|---------|
|                    | No.         | Net     | No.          | Net     |
|                    | ships       | tonnage | ships        | tonnage |
| May, 1932 .....    | 154         | 669,735 | 152          | 649,509 |
| April .....        | 146         | 663,647 | 144          | 613,085 |
| March .....        | 139         | 645,331 | 162          | 709,778 |
| February .....     | 149         | 638,222 | 144          | 583,030 |
| January .....      | 145         | 635,218 | 147          | 646,987 |
| December .....     | 155         | 649,915 | 122          | 579,608 |
| November .....     | 167         | 688,934 | 149          | 614,482 |
| October .....      | 167         | 688,934 | 149          | 614,482 |
| September .....    | 158         | 658,088 | 159          | 673,120 |
| August, 1931 ..... | 140         | 636,189 | 160          | 665,108 |



# Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Shipping Board Loans Made, Authorized or Pending

**T**HE S. S. MANHATTAN, under construction at the New York Shipbuilding Co., Camden, N. J. for transatlantic service of the United States lines under management of the Roosevelt Steamship Co., will have her sea trials sometime during July over the measured mile course off Rockland, Me. She will sail from New York on her first voyage Aug. 10, under the command of Capt. George Fried.

Her sister ship, under construction at the same yard, it has been announced by P. A. S. Franklin, chairman of the board of the Roosevelt Steamship Co., will be named the WASHINGTON. The WASHINGTON is scheduled for launching the latter part of August and will be ready for service next year.

## Work to Private Yards

H. G. Smith, president of the National Council of American Shipbuilders, on June 16 presented the case of the shipbuilders before a special committee of the house of representatives investigating government competition with private business. He offered the suggestion that construction of vessels of all kinds for government service should be done entirely by private shipbuilding companies through competitive bidding.

He pointed out that the government has been doing much of its shipbuilding during the last 10 or 15 years of naval vessels, construction and repair of vessels for the army, the coastguard and other government vessels in government establishments.

Approximately \$155,000,000 out of \$295,000,000 in new ships built since the war have been done in government yards. Mr. Smith said, "These vessels are built from funds raised from taxes, and when the vessels are built by the government it is just taking that large volume of business from private industry on which taxes are paid." By agreement with the committee Mr. Smith will present a more detailed statement concerning this matter at a later meeting when it will be given further consideration.

## Start Work on Tender

The Bath Iron Works Corp. is preparing to start work on the 131-foot United States lighthouse tender HICKORY with the expectation of making delivery in February, 1933. The prin-

cipal dimensions are: molded beam, 24 feet 6 inches; depth, 11 feet 9 inches; draft, 8 feet 6 inches; and displacement, 600 tons. The new tender will be propelled by a 500-horse power triple expansion engine, 11½ x 19 x 32 inches x 24-inch stroke. Steam will be furnished by one Babcock & Wilcox watertube boiler.

## Diamond Line Vessels

The BLACK EAGLE, first of six vessels undergoing modernization for the American Diamond lines at the Federal Shipbuilding & Dry Dock Co., Kearny, N. J., sailed June 15, from New York to Antwerp on her maiden voyage. In addition to her usual cargo she carried ten passengers and \$3,000,000 in gold.

On her sea trials the BLACK EAGLE attained a speed of 15.36 knots, making her, it is claimed, the fastest of American cargo ships. The work of reconditioning included remodeling the stern, lengthening the ship somewhat on the waterline, and the installation of a specially designed propeller. The results were better than anticipated and it is believed that she can maintain a speed of 14½ knots in service.

The BLACK EAGLE will be followed at regular intervals by the BLACK GULL, BLACK TERN, BLACK HERON, BLACK FALCON and BLACK HAWK. This line was purchased from the shipping board in September, 1931. The terms of the mail contract called for the reconstruction of the six vessels referred to above and the construction of five new vessels of 16 knots speed to be ready at the beginning of the third, fifth, seventh, ninth and tenth years of the life of the contract.

## Sinks after Collision

On May 27, during a dense fog, the freighter GRECIAN of the Merchants & Miners Transportation Co. was sunk in collision with the Savannah liner CITY OF CHATTANOOGA off Block island. Four members of the crew of the GRECIAN were lost and two others seriously injured. According to reports the CITY OF CHATTANOOGA was only slightly damaged and she stood by, picking up 32 of the freighter's crew including the master.

Beginning July 1, the Luckenbach Steamship Co. will pay the City of

Philadelphia \$75,000 a year for rental of its largest municipal pier, No. 84 South. A five-year lease at an annual rental of \$125,000 per year held by the same company expired June 30.

## Submarine Commissioned

The navy's latest submarine, the U. S. S. DOLPHIN went into commission at the navy yard, Portsmouth, N. H., June 1.

The DOLPHIN will be commanded by Lieut. John B. Griggs. The new submarine is 319 feet 1½ inches long, cost \$2,000,000 to build and carries a crew of 6 officers and 52 men. The DOLPHIN was built at the Portsmouth navy yard and will have her builder's trials during July with her shake-down cruise in September after which she becomes a unit of submarine division 12 based on the Pacific coast.

## To Refit Famous Clipper

It may be magnificent, but it isn't business would probably be a natural reaction to the news that a famous clipper ship built in 1876 in Dumbarton, Scotland is to be refitted in the same rig in which she established a sailing record between London and Calcutta in 1877. It is reported as a fact however, that the bark CORIOLANUS noted for her brilliant career will be fitted out in Bath Me. as a full rigged clipper ship. When completed she will sail out of Boston again to engage in trade with Africa.

She was bought by a syndicate headed by C. Nelson Rogers of Boston, and will return to Boston as soon as her new masts have been stepped and her rigging and sails completely refitted in the original manner. From Boston she is to sail with a cargo for a trading voyage to Africa. In recent years the CORIOLANUS has been engaged in the packet trade between New Bedford and Cape Verde Islands.

Repairs to the Canadian National steamer PRINCE DAVID, severely damaged on a reef near Hamilton, Bermuda, last March, will be carried out at the Halifax Shipyards Ltd.

The contract for repairing the vessel was let by the London Salvage association at a total cost of something over \$400,000. Three Canadian and three United States shipyards competed for the work.



## New Quarantine Tug

A new steel tug for the foreign quarantine division of the United States public health service is now under construction by the Spedden Shipbuilding Co. Inc. at Baltimore. This vessel will be attached to the quarantine station at New Orleans and will be used for general quarantine work including principally the transportation of public health service doctors and inspectors to incoming ships.

The vessel is 71 feet overall in length, 16 feet molded beam, 10 feet 10 inches deep, has a load draft of 8 feet, and was designed by P. W. Clark, naval architect for the public health service. Delivery is expected in the latter part of January, 1933.

One of the unique features of the construction of this vessel is the use of hull plates of genuine wrought iron, containing no scrap, furnished by A. M. Byers Co. All hull rivets will also be of wrought iron, containing no scrap, furnished by Ulster Iron Works. According to information received from the public health service the use of wrought iron in this manner has been found to materially minimize difficulties due to electrolytic action and corrosion.

The propelling machinery will be a six-cylinder direct reversible 10 by 12 1/2 inches Fairbanks Morse & Co. diesel engine. The same company will also furnish the auxiliary generator-compressor-fire pump unit. Electricity, required only for lighting purposes, will be 110 volts direct current. The generator unit will be arranged for air or hand starting.

## Bids for Derrick Boat

The United States engineer office, Room 710, Army building, 39 Whitehall street, New York, will receive bids until 12 m. daylight saving time, July 13, 1932 for furnishing all labor and material and performing all work for constructing and delivering afloat one wooden hull for derrick boat. Bids must be submitted upon the standard government form and the successful bidder will be required to execute the standard government form of contract for

construction. Where copies of plans are requested no deposit will be required.

## Motorship Georgic Ready

A new White Star liner, the motorship GEORGIC, sister ship of the BRITANNIC was delivered on June 13, by her builder, the Harland & Wolff Shipbuilding Co., Belfast. The trial performance of the new vessel, which with her sister ship, shares the honor of being the largest British-built motorship, proved satisfactory in every respect. Her schedule calls for sailing from Liverpool June 25 and arrival in New York on July 4. Her first sailing from this side will be July 9. With the BRITANNIC, ADRIATIC and BALTIC, she will operate in the New York-Liverpool run.

## A Disastrous Explosion

In a series of terrific explosions, June 17, on the tanker CYMBELINE in Vickers drydock at Montreal, Que., a large number of men, reported to be as high as 27, were killed and at least 46 others were injured. The estimated property damage totals several million dollars. The great drydock as well as the vessel was reported wrecked. Oddly enough, reports indicated that none of the 34 members of the tanker's crew who were asleep on board when the first explosion took place were killed or injured seriously. The drydock sank after the explosion.

Nothing definite has yet been established as to the real cause of the fire, though the assumption is that explosive gas in the tanker was set on fire from red hot rivets.

The last and most serious explosion occurred while firemen were fighting the blaze. The power of the detonations is indicated by the report that all windows in homes and buildings within a radius of a mile were broken. The CYMBELINE was owned by C. F. Bowring of Liverpool, England. She was built in 1927.

The most thorough investigation of this terrible disaster will undoubtedly be carried out by the Canadian authorities. Findings are awaited with the greatest interest.

## S. S. Acadia Enters Service

The second of the two new Eastern Steamship liners, the twin screw turbine geared ACADIA, successfully passed her sea trials on June 1. At that time she demonstrated her ability to attain a speed of 22 knots. The trials lasted all day and were held off the Virginia Capes. Capt. Eugene O'Donnell, president of the Eastern lines who was present during the trials said that the new vessel had acted satisfactory in all tests and that in his opinion no ship could be better built. Her designer, Theodore E. Ferris, the New York naval architect and William K. Irving, vice president of the Eastern Steamship lines, were also on board.

The ACADIA, sister ship of the SAINT JOHN, completely described in the June issue of MARINE REVIEW was built at a cost of \$3,500,000 by the Newport News Shipbuilding and Dry Dock Co. She arrived in New York on June 9 and docked at Pier 18, North river. She sailed on her maiden voyage from New York to Yarmouth, N. S. on June 16 and will continue in this service during the summer months. In the winter present plans are for her to join the SAINT JOHN in the service of the Eastern Steamship lines between New York and Boston.

## Bids to Remove Wreck

The United States engineer office, 401 Custom House, San Francisco, will receive bids until 3 p.m. July 22 for furnishing all labor and material and performing all work for removing the sunken and abandoned schooner barge SIMLA lying in the North channel in Oakland harbor, Calif. A guarantee will be required with each bid, also a performance bond will be required. Bids must be submitted upon the standard government form of bid and the successful bidder will be required to execute war department form 19a, articles of agreement.

At the United States Marshall's sale, June 6 in New York the Steamship MINEOLA was sold for \$17,250 to W. R. Grace and Co. The MINEOLA, a freighter of 2488 gross tons.

## Bunker Prices

### At New York

|                 | Coal<br>alongside<br>per ton | Fuel oil<br>alongside<br>per barrel | Diesel engine<br>oil alongside<br>per gallon |
|-----------------|------------------------------|-------------------------------------|--|
| June 18, 1932   | 4.50@5.00                    | .80                                 | 3.70   |
| May 18, .....   | 4.50@5.00                    | .75                                 | 3.70   |
| April 18, ..... | 4.50@5.00                    | .70                                 | .....  |
| Mar. 18, .....  | 4.50@5.00                    | .65                                 | 3.25   |
| Feb. 18, .....  | 4.50@5.00                    | .65                                 | 3.25   |
| Jan. 18, .....  | 4.50@5.00                    | .65                                 | 3.25   |
| Dec. 18, .....  | 4.50@5.00                    | .65                                 | 3.25   |
| Nov. 18, .....  | 4.50@5.00                    | .65                                 | 3.25   |
| Oct. 18, .....  | 4.75@5.00                    | .65                                 | 3.25   |
| Sept. 18, ..... | 4.75@5.00                    | .75                                 | 3.47 1/2                                     |
| Aug. 18, .....  | 4.75@5.00                    | .75                                 | 3.47 1/2                                     |

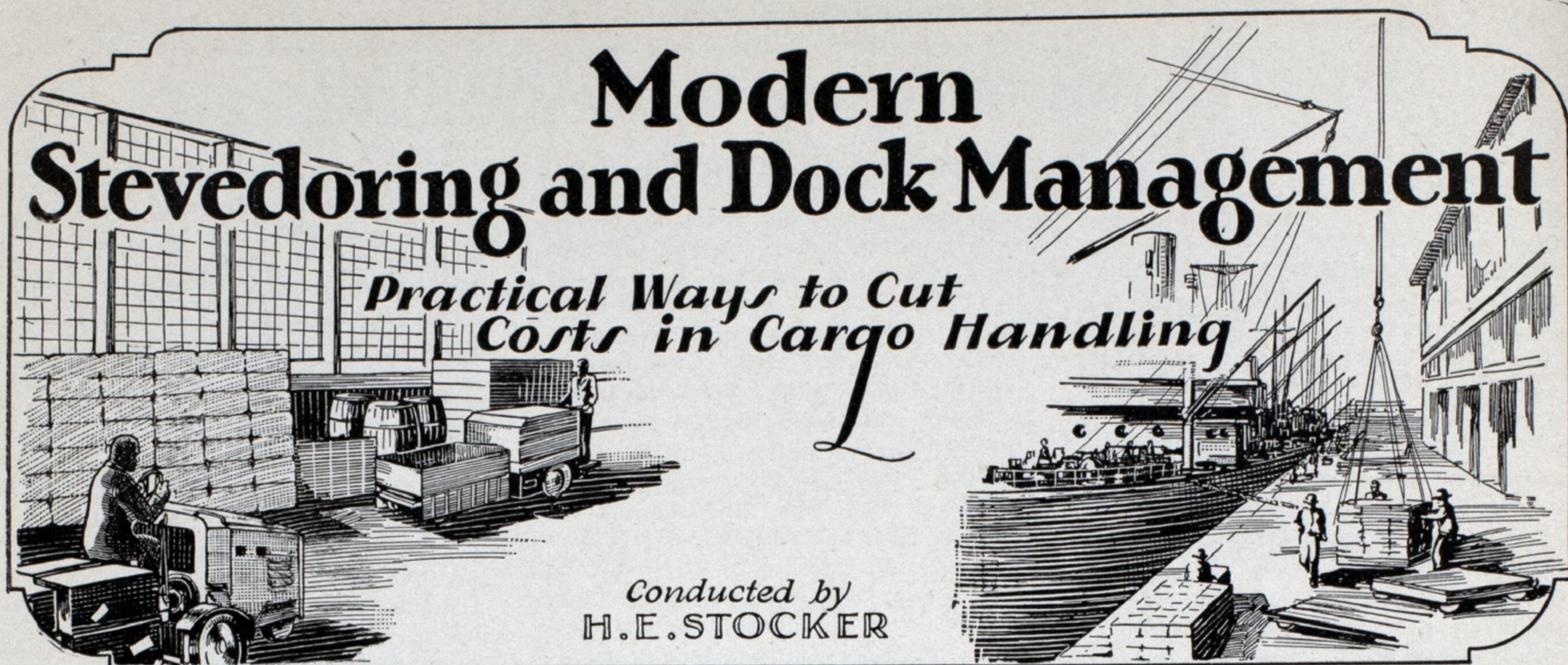
### At Philadelphia

|                 | Coal<br>trim in bunk<br>per ton | Fuel oil<br>alongside<br>per barrel | Diesel engine<br>oil alongside<br>per gallon |
|-----------------|---------------------------------|-------------------------------------|--|
| June 18, 1932   | 4.50@5.00                       | .80                                 | 3.69   |
| May 18, .....   | 4.50@5.00                       | .80                                 | 3.69   |
| April 18, ..... | 4.50@5.00                       | .75                                 | 3.21   |
| Mar. 18, .....  | 4.50@5.00                       | .65                                 | 3.21   |
| Feb. 18, .....  | 4.50@5.00                       | .75                                 | 3.45   |
| Jan. 18, .....  | 4.50@5.00                       | .75                                 | 3.45   |
| Dec. 18, .....  | 4.50@5.00                       | .75                                 | 3.45   |
| Nov. 18, .....  | 4.50@5.00                       | .75                                 | 3.45   |
| Oct. 18, .....  | 4.75@5.00                       | .75                                 | 3.45   |
| Sept. 18, ..... | 4.75@5.00                       | .75                                 | 3.45   |
| Aug. 18, .....  | 4.75@5.00                       | .75                                 | 3.45   |

### Other Ports

| June 18, 1932                                       |        |
|---|--------|
| Boston, coal, per ton..                             | \$7.11 |
| Boston, oil, f. a. s., per<br>barrel.....           | 0.76   |
| Hampton Roads, coal, per<br>ton, f.o.b., piers..... | \$4.25 |
| Cardiff, coal, per ton...                           | 13s 6d |
| London, coal, per ton...                            | —s —d  |
| Antwerp, coal, per ton...                           | 18s 0d |
| Antwerp, Fuel oil, per ton.                         | 67s 6d |
| Antwerp, Diesel oil, per<br>ton.....                | 82s 6d |
| British ports, Fuel oil...                          | 67s 6d |
| British ports, Diesel oil.                          | 82s 6d |





# Minds Open to New Ideas Are Essential in Solving Shipping Problems

By H. E. Stocker

**T**HE science of psychology and the science of business organization are in a state of flux, but certain fundamental business truths have been recognized for hundreds of years, truths which psychology has proved, and explained. We can, therefore, safely base our plans for an organization upon these established facts and principles.

In selecting a man for a higher position in any capacity of an organization, it is vital to consider carefully the effect that a higher position will have upon the man so selected. This is of equal importance with a knowledge of his past successes in other less important positions in or out of the organization.

## Character Change After Promotion

A change of character often comes over a man when he is promoted to a higher position and this change of character is destructive to proper efficiency. A man who is psychologically a different man after his appointment to a higher position on the basis of his previous successes, is unsuited to the exigencies of the new situation and falls short of satisfactory results. Titles, fancy offices and other trappings of executive positions often have deleterious effects upon men's minds when they are promoted to such positions. Often casual analysis will disclose this trait in a man and is a reason for withholding promotion. A man's attitude toward his work should not change

after a promotion.

Certain characteristics of men eligible for promotion may be disclosed by a careful investigation. Some men display a strong tendency to suppress the initiative of associates and assistants which results in a hesitancy on the part of the associates and assistants to develop and present new ideas. In considering men for positions of authority this tendency of repression should be well analysed before conferring the promotion. The promotion of such men proves detrimental to the company. It is most disconcerting for a subordinate to feel that he cannot go before his boss with the facts of a problem and get a decision based on those facts.

Having been placed under an authority who frowns on initiative subordinates will adopt the policy of never "starting anything." They will do the simple work of their jobs and will not risk the embarrassment of making suggestions. Because the criticism of such a boss is usually most unjust and usually made in a humiliating manner, the subordinates, to avoid criticism, spend twice as much time as needed in checking all work that they think may be seen by the boss.

The executive type of mind should be creative. This requires a *real* open mind. No person claims to be other than open minded. Most men would deny emphatically that they were not open minded, yet they re-

sent vigorously the influx of new ideas and new data, seriously reducing their value in terms of productivity of net profits.

The casual manner in which valuable experience is ignored is a serious handicap in organizations where such experience is badly needed to increase efficiency.

## A Quality of Leadership

An essential quality of leadership is the ability to analyse, or if not that, the wisdom to employ assistants who *are* good analysts. The wise man is he who knows when to employ experts.

One of the chief functions of executive leadership is the co-ordination of the efforts of a group of experts. A good marine engineer, a good traffic man, a good marine superintendent and a good auditor will have much of their value to the organization destroyed if their efforts are not co-ordinated by the chief executive of the company.

Directing a shipping company, or any department of a shipping company, requires ability and experience in directing an organization, as well as experience in the technical phases of the work. When the person involved has the wisdom to employ the experience of technical experts, it is possible that this ability to create *teamwork* is more important than technical knowledge.

The skill in utilizing the knowledge of others is of vast importance,



particularly now when new techniques are employed in business management.

Modern business requires technical skill. Skill in utilization of modern tools of management is essential to a maximum business success, often it is the way from loss to profits.

Modern business budgeting and accounting, and wage incentives, have been discussed in previous articles. Another modern tool of management is facilities for the development and utilization of new ideas. New ideas have always been the life blood of business. Modern business management has injected the new idea of "new idea facilities."

### Technical Skill Is Required

Organized efforts for the development of new ideas has proved highly profitable. Some companies have research departments on which many thousands of dollars are expended yearly. Others conduct suggestion campaigns, realizing that in the minds of their employees is a mine of valuable information which is not adequately tapped by ordinary methods.

The search for new ideas must be conducted by a man with imagination vision and analytical ability, otherwise the search is restricted to a narrow field and many valuable ideas are lost. Profitable ideas are found not only in one's own particular industry but also in other industries.

In one instance, the cost of reducing the discharging of a certain commodity was brought about by a suggestion from a photograph in a manufacturers' magazine. The two operations were totally different but nevertheless the photograph caused a new idea to crystallize and later brought about a reduction in stevedoring costs.

The work of a terminal organization was improved 17 per cent by an intelligent application of new ideas obtained from a merchandising house, a bank, a shipyard, and a number of other terminals, railroad and steamship, handling different classes of freight under a variety of conditions. Differences in conditions did not prevent the adaption of new ideas to the methods of attacking problems characteristic of all terminals. The bank suggested a method of analysis that disclosed many opportunities for eliminating waste.

### Real Analysis Brings Results

A constant aggressive analysis of a stevedoring operation and a constant unrelenting analysis of all details, and the relation of all details one to another, will lead to discoveries which will cut costs and increase business. Such an analysis is best guided by a knowledge of the principles of stevedoring. Numerous mistakes are avoided by this

kind of analysis. Statements of fact and opinion should be analysed to determine the accuracy of statements. Years of experience do not give sanctity to statements of experienced men, particularly when conditions have changed. The use of knowledge of the most effective methods of analysing problems will often disclose opportunities for large savings.

An executive whose mind is crowded with a heterogeneous array of facts is not necessarily an able executive or one equipped to develop new ideas. Such a mind may be petty, uncomprehending, wrapped in the pride of its own collection of facts but without *real* understanding of their meaning. Real accomplishment comes when there is an understanding of the essentials—when substance is valued more than mere form.

Many opportunities for economy are discovered when the man selected for an executive position is *waste* conscious. An attitude alert for opportunities to reduce waste of time

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## In a Good Organization

Definite and clean cut responsibilities should be assigned to each executive.

Responsibility should always be coupled with corresponding authority.

No change should be made in the scope or responsibilities of a position without a definite understanding to that effect on the part of all persons concerned.

No officer or employe, occupying a single position in the organization, should be subject to definite orders from more than one source.

Orders should never be given to subordinates over the head of a responsible officer. Rather than do this the officer in question should be supplanted.

Criticisms of subordinates should, whenever possible, be made privately, and in no case should a subordinate be criticized in the presence of officers or employes of equal or lower rank.

No dispute or difference between officers or employes as to authority or responsibilities should be considered too trivial for prompt and careful adjudication.

Promotions, wage changes, and disciplinary action should always be approved by the officer immediately superior to the one directly responsible.

No officer or employe should ever be required, or expected to be at the same time an assistant to, and critic of, another.

Any officer whose work is subject to regular inspection should, whenever practicable, be given the assistance and facilities necessary to enable him to maintain an independent check of the quality of his work.

Note: The above, entitled *Ten Commandments of Good Organization*, was written by M. C. Rorty, vice president, International Telephone & Telegraph Co. and was originally published by the American Management association.

and money results in large savings.

More brains are required in this age to become a truly successful executive and we have a limited supply of men properly equipped. The utmost care should be expended in the selection of men for promotion, particularly in the control positions where decisions are made involving large sums and where mistakes are costly.

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## Efficiency of Fireboats

Criticism has been leveled at the efficiency of New York city fireboats. The recent Cunard pier fire is quoted as an example of the inability of any of the fireboats to properly throw a stream of water under the piers. It was suggested that the Cunard pier fire might have been prevented had the fireboats been equipped with large nozzles located low enough to permit playing a powerful stream under the pier at high tide. The city fire headquarters say that the problem of under-pier fires is being carefully studied with the view of developing adequate equipment to meet this condition.

J. F. McMillan, treasurer and general manager of the Kingston, Ont., Shipbuilding Co., died June 15 in his home in that city following a brief illness. He was a shipbuilder in Scotland before taking up his residence in Canada.

E. K. Morse has resigned as freight traffic manager of the Munson Steamship line and has become associated with Seatrain Lines Inc., as a vice president. He assumed his new duties in the New York office on June 16.

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## Georges Philippar Fire

Loss of life in a disastrous fire which destroyed the five-month old French motor liner GEORGES PHILIPPAR, in the Gulf of Aden on May 16, on her return voyage from China to Marseilles, is now reported as 35.

This disaster has thoroughly aroused both government and private sources concerned with the safety of life at sea. One feature, the extremely rapid headway of the fire, has not yet been satisfactorily explained except on the basis of suspicion of incendiarism.

The preliminary inquiry indicates that four fires were reported to have broken out simultaneously in different parts of the ship. Passengers, also it is said, reported the breaking out of a fire which was quickly put out, on board while the ship was at Shanghai. The complete inquiry will no doubt establish the true facts of the case and suggestions for prevention.



# Power is Reduced by Using Modern Rubber Tires

By H. E. Stocker

**R**UBBER tires for trailers and trucks have gained in use in the last few years because of the development of a new compound that has produced a tire suitable for terminal conditions.

The complaint against the old type of rubber tire, when it was used on trailers and trucks, was that greater effort was needed to move the load. This complaint led to the development of the tire compound that, from several standpoints, has proved better than steel wheels.

Trailers equipped with these modern rubber tires can be moved with less effort as demonstrated by the results of tests made by the manufacturers.

Two trailers were tested one designated as "A" weighing 550 pounds fitted with modern rubber tires; and the other known as "B" weighing 630 pounds, fitted with the old type of tires. The draw bar pull was accurately measured for starting and maintaining motion in light and loaded operating conditions with varying loads up to 1000 pounds.

## Results Show Superiority

The results proved that the trailer equipped with the modern type of tires required far lower draw bar pull to start and to keep in motion. For instance, to start in light condition, trailer "A" required a draw bar pull of  $1\frac{1}{4}$  pounds while trailer "B" required a draw bar pull of  $5\frac{3}{4}$  pounds. Loaded with 1000 pounds trailer "A" required a pull of only 9 pounds; while trailer "B" with an equal load required a pull of  $26\frac{1}{2}$  pounds. To keep in motion the respective pulls were 20 and 30

pounds. Similarly on a 45 degree incline to start with a load of 1000 pounds the respective pulls for trailers "A" and "B" were 16 and  $40\frac{1}{2}$  pounds.

In another test on a 4-wheel baggage truck weighing 1480 pounds empty and with a pay load of 2880 pounds it was found that the draw bar pull to start was respectively 105 pounds and 60 pounds with the old and new type of rubber tires. To maintain motion the amounts were respectively 70 and 25 pounds. These tests seem to show conclusively the great superiority of the New type of tire for this service.

The test shown on page 59 of the April issue of the MARINE REVIEW should also be considered.

These draw bar pull tests have been borne out by trailers and trucks equipped with modern tires, operating in regular service. The resiliency of a tire largely determines the power necessary to start a truck or trailer to roll and to keep the truck moving. Tests made show that the new tire is 21 per cent more flexible than the old tire and is 157 per cent better in the rebound.

The saving in power, man or mechanical, results in battery charges lasting longer, or in less gasoline used. When trucks or trailers are moved by hand, rubber tires relieve the strain and jar from arms and shoulders, thus reducing fatigue.

## Reduction of Noise a Factor

The reduction of noise through the use of rubber tires is also a factor in lessening fatigue, as well as giving a better all around operation. In my experience the most efficient freight handling operations are

those in which all unnecessary noises are reduced to the minimum.

Only a few days ago I was present on a terminal that changed its stevedores. The former stevedore used trucks fitted with steel wheels. The new stevedore uses modern caster type trailers fitted with rubber tires. The reduction in noise was immediately noticeable.

These modern trailers, handled by hand or by tractors, as conditions make advisable, and their use directed by experienced men, make possible a substantial reduction in costs.

## Reduces Wear of Floors

Steel wheels cause more wear and tear of floors. The condition of wooden floors after a few years of use under steel wheels becomes a serious handicap to the movement of trucks and trailers. The work is slowed because of the necessity of reducing speed and because packages are jarred from the trucks or trailers, causing damage to the freight and making it necessary to stop the train to pick up the packages.

Dirt soon makes the smoothest floor rough, the degree of roughness being in proportion to the amount and character of dirt which has collected. Grains of rice, sugar, sand and refuse of many kinds cause good trucking surfaces to become poor trucking surfaces. Regardless of the efforts made to keep a terminal "shipshape," it is impossible to keep the trucking surface clean unless an excessive amount is expended for cleaning. By using rubber tired equipment this condition is offset to an important degree because of the less effort required to move a rubber tired truck or trailer.

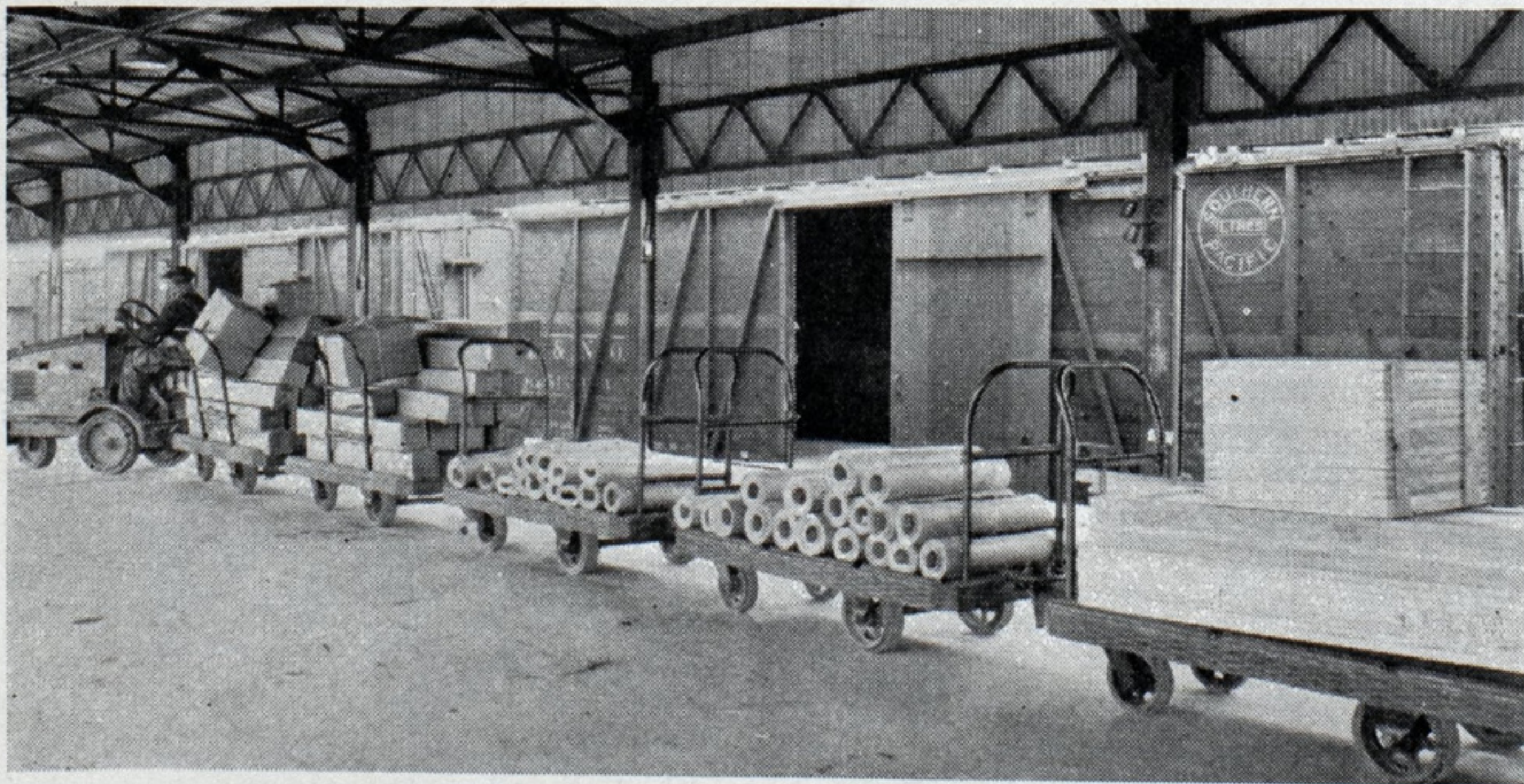
The maintenance and renewal of floors in some cases runs into large sums. This heavy expense can be avoided by equipping all trucks and trailers with modern rubber tires. The maintenance and repair costs of the equipment itself is reduced when rubber tires are used.

Turning radius of tractor and trailer trams are reduced when the tractor and trailers are equipped with rubber tires. Steel wheels have a tendency to slide on turns, with the result that many times the trailer hits a post or piles of cargo. Rubber tires prevent this slipping tendency.

## A Port Newark Service

The American-Hawaiian Steamship Co., effective June 13, and every Monday thereafter, will establish a weekly sailing service from the Port of Newark to ports along the Pacific coast.

Officials of the American-Hawaiian Steamship Co. have announced that at present the facilities at the Newark Seaboard terminal, formerly the army supply base property, will be used.



*A Fleet of Rubber Tired Trailers Serves this Large Terminal*



# Useful Hints on Cargo Handling



**E**FFICIENCY engineers are much maligned and sometimes rightfully so. There is scarcely a business man who can not illustrate with at least one story, the dumb efficiency of efficiency engineers.

However, the justifiable complaint against the so-called efficiency engineer should not blind men to the profits to be made from the utilization of competent consulting engineers, and other outside assistance. A competent consulting engineer or other specialist can be employed to great advantage. These men have broad contacts and long experience and as a result are tactful in working with an organization.

The qualified consultant brings ideas and information and new viewpoints to an organization. New ideas and information and new viewpoints are important in every organization. He will assist men in doing their work by supplying them with better tools and not by showing them their errors.

The time element in business is important. The average man lacks sufficient time to develop new ideas by travel and by painstaking analysis. A good applicable test is to determine how much time is used in looking for new ideas. You will probably, at best, put the figure at 10 per cent, whereas the consulting engineer is developing new ideas 80 per cent of the time.

A consulting engineer acts as a clearing house for new ideas. His contacts are wider than the contacts of a man in the employ of one organization and he not only gets more new ideas for *that* reason but because of the stimulating effect of wide contacts.

## Slinging Trailers Overall

**W**HEN it is the practice to sling trailers overall, a stop for the tackle should be placed on the under part of the frame on each side. This makes the load carry better and tends to prevent damage to the rear end of the trailer.

When bulky cargo is to be handled flair boards can be attached to the sides of the trailer. This is preferable to using trays or platform slings because the flair boards cost less, take less storage space and facilitate extension of the practice of slinging trailers overall.

Automatic couplers for trailers should be selected with care. Some types will not couple if the trailer is

*THIS page is being devoted to short items on all matters having to do with the more efficient turn-around of ships. These items are intended to be of a helpful nature.*

*We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.*

not on an even surface. At a Coastwise pier recently I saw considerable delay caused at ship's side in coupling tractor to trailer because the rear end of the trailer was slightly higher than the forward end.

When using a "pie plate" sling for handling drums of oil, rolls of Kraft paper, etc., it is a good idea to make paint marks on the net sling so men will always get the pie plate in the middle of the net.

## Handling Cotton Rapidly

**C**OTTON is handled rapidly with a small gang using cotton hooks. The hooks take two bales at a time. Twelve men are used in a gang distributed as follows: two men in the hold, three men on deck, six men on lighter, and one foreman.

Bales of cotton linters are also handled with cotton hooks. It has been suggested that a hook with four points is better for cotton linters because the short fibre makes it difficult for a single point hook to get a "bite."

Hooks should be of round steel or if hexagonal steel is used, should be rounded at the eye to prevent undue wear on the rope. Rope is considered better than chain because the rope can be shifted from time to time and the wear spread over considerable length of rope. When a slingload of cotton is landed, men should be trained to land it so the bales are in the position for rolling as directly as possible to point of stowage.

One steamship line makes a practice of discharging cotton from hold to deck with ship's gear and then handling to stowage on lighter with the lighter's boom and gear.

When stowing cartons, dunnage should be laid solid to prevent cases breaking. When dunnage is not solid

cases are apt to become damaged where they overlap the edge of the dunnage.

Rolls of rugs should not be handled with rope slings.

Sacks of flour, partially wet, can be saved by letting the sacks dry and then beating the hard flour and brushing the bag with a stiff brush.

Notices of arrival should be stamped together with date when free time expires, to avoid misunderstandings and to get quick delivery of cargo.

## Protect Cargo Carefully

**T**HE provision of "walking boards" for men is advisable where cargo is damaged by walking on the packages. Mates in the holds should set a good example and avoid walking on cargo as much as possible. Many times they can walk or stand on wooden cases, yet they will be found at the opposite end of the hatch standing on frail fibre cases. Ship officers should bear in mind that next to the safety of the ship it is their duty to exercise the greatest care to protect the cargo so that it may be delivered in as good a condition as received. The good rating of an officer otherwise competent will suffer from neglect or carelessness in the performance of this duty.

Signs on piles of cargo, which remain on a terminal very long, assist in avoiding cross deliveries.

Drums of lubricating oil were damaged by stowing the drums on uneven surface of tanks tops. Proper use of dunnage would have prevented this damage.

Cheese was stowed on sawdust to prevent oil going through hatch covers to damage cargo in the lower hold.

Stowage of brazil nuts near rubber results in contamination of the nuts.

When leaky barrels must be received and stowed in a ship, damage to other cargo can be prevented by stowing in fo'castle. Such cargo may also be stowed in the bridge deck, if cargo is not damaged by heat.

Permanent dunnage around stanchions saves in stevedore labor.



# Up and Down the Great Lakes

Reduced Traffic on the Lakes—Canadian Coastwise Law—Lake Levels  
Lakes-to-Gulf Waterway—Vessels Ground—Freight Rates Same

**S**HIPMENTS on the Great Lakes so far this season have dropped to an extremely low point. During the past month of May, for instance, the total lake movement in Lake Superior iron ore amounted to only 110,826 tons as compared with 1,769,295 tons for the month of May, 1931. The total movement of iron ore this year up to June 1, is 154,899 tons compared with 1,945,216 tons in the season of 1931 up to June 1.

For May this year, the total freight of all kinds through the Canadian and United States locks amounted to only 1,568,462 tons as against 4,335,021 tons in May, 1931 and 11,319,757 tons in May, 1930. We have already mentioned iron ore which was considerably less than one-tenth of the 1931 tonnage, while wheat this year during the month of May was lighter than last year by 11,901,080 bushels. Other grains decreased by 57 per cent. The westward movement of coal was also lighter than in May last year by 54 per cent.

Conditions through the Welland ship canal were much better, though a light grain movement reduced the total traffic through this canal from 1,165,853 tons in May, 1931 to 1,036,879 tons for May this year. Increases over last year were recorded for rye, 90,154 tons; corn, 12,464 tons; sugar shipments, 19,168 tons; merchandise, 22,804 tons and bituminous coal, 10,323 tons. A decrease in movement is recorded for wheat, barley and oats.

## A Record Coal Cargo

Late in May the steamer **EMPEROR** of the Canada Steamship lines is said to have established a new record for weight of a single cargo of coal. She arrived in the Port of Hamilton, Ont. with a cargo of 10,566 tons of coal from Sandusky, O. The coal was consigned to the Steel Company of Canada. Another unusual feature in connection with the voyage of the **EMPEROR** was her draft of 20 feet on entering the Hamilton harbor. This is said to be the greatest draft of any vessel in passing through the Burlington canal.

## Capt. J. H. Rinn Dies

Capt. J. B. Rinn died at the Marine hospital, Detroit on May 29. He was 62 years of age and had sailed on the

Great Lakes for 45 years. For the last 12 years he had been master of the steamer **J. E. UPSON** of the Wilson Transit Co. For the last 16 years as a Great Lakes captain he had not had a major accident of any kind. He was considered one of the best navigators on the lakes. He served for three consecutive years on the Lake Carriers' committee on navigation. Captain Rinn is survived by his widow, one daughter and a son.

## May Lake Levels

The United States Lake Survey reports the monthly mean stages of the Great Lakes for the month of May as follows:

| Lake                 | Feet above mean sea level |
|----------------------|---------------------------|
| Superior .....       | 602.20                    |
| Michigan-Huron ..... | 578.56                    |
| St. Clair .....      | 574.29                    |
| Erie .....           | 571.82                    |
| Ontario .....        | 246.14                    |

Lake Superior was 0.30 foot higher than in April and it was 0.50 foot higher than the May stage of a year ago.

Lakes Michigan-Huron were 0.18 foot higher than in April and they were 0.58 foot lower than the May stage of a year ago.

Lake Erie was 0.21 foot higher than in April and it was 0.36 foot higher than the May stage of a year ago.

Lake Ontario was 0.32 foot higher than in April and it was 1.01 feet higher than the May stage of a year ago, 0.19 foot below the average stage of May of the last ten years.

## Canadian Coastwise Bill

The Canadian bill, reported in the last issue of **MARINE REVIEW**, designed to amend the Canadian shipping laws so that vessels of foreign registry would not be allowed to engage in coastwise shipping, it is reported, has been withdrawn, the reasons being, according to the Canadian minister of marine, that it was impossible to reconcile the many and varied representation received in connection with the proposed measure.

It is understood that though it is withdrawn for the time being, it will be re-introduced at the next session of parliament when a better opportunity will be had to make a thorough

study of the situation and to give all parties concerned an opportunity to be heard.

## Master of Tug Favorite

Succeeding the late Capt. Alex Cunningham, Capt. Fred A. Bailey has been appointed master of the Great Lakes Towing Co's. famous wrecking tug **FAVORITE**. His appointment was announced by H. E. Gilpin, president of the towing company.

Captain Bailey is widely known on the Great Lakes as a capable master of ships. He has had many years experience and served as master with the Pittsburgh Steamship Co. He also served in the same company as shore captain in which capacity he remained until he became manager of the Forest City Steamship Co. fleet. When this company went out of business he joined the Great Lakes Towing Co. ashore as wreck master.

One of his outstanding feats in this capacity was the release of some 200 ships icebound in the St. Mary's river in the winter of 1926. One of the most effective icebreakers at that time was the carferry **ST. MARIE** and it was while skilfully piloting this vessel that he was finally able to break the ice sufficiently to release the imprisoned freighters.

## Thomas W. Braund Dies

Well known as fleet engineer of the Bethlehem Transportation Co. and the Franklin Steamship Co., Thomas W. Braund, died in Cleveland, June 21. He was 60 years of age.

His career on the Great Lakes began when he was about 18. He served on the Beaver Steamship Co's. vessels and with the Gilchrist Steamship Co. He joined the Franklin and Bethlehem fleets in 1910 and superintended the construction of the steamers **FRED G. HARTWELL**, **EMERY L. FORD** and the **E. J. BERWIND**. A number of his ideas were incorporated in the construction of these vessels and he served as chief engineer on each for a time when they were brought out.

National Terminals Corp. has taken over for operation the Nicholson-Universal dock and terminal facilities at Milwaukee, Detroit and Cleveland.



## Three Lake Port Surveys Issued by Board

During June three comprehensive publications, describing in detail the port facilities of Chicago, Cleveland and Duluth Superior, have been issued jointly by the United States shipping board, bureau of operations and the board of engineers for rivers and harbors of the war department. Each book devoted to one of these ports gives authentic and dependable data on the facilities for commerce and shipping.

Detailed information is given regarding piers, wharves, docks, grain elevators, storage warehouses, bulk freight storage, drydocks and marine repair plants, as well as a complete description of the various channels and basins comprising the harbors. Conditions, regulations, services and charges to ships and cargo and the practices and charges in connection with terminal services of the railroad and steamship lines entering each port are also discussed.

Copies of these reports may be had for a nominal sum by addressing the Government Printing office, Washington.

## Two Steamers Go Aground

The freighter MORRIS S. TREMAINE went aground on a reef on South Fox island in Lake Michigan, June 4. There was a heavy fog at the time. She was released on June 6 by lightering about 2500 tons of her coal cargo. She was bound from Toledo to Milwaukee. The Great Lakes Towing Co.'s wrecking tug FAVORITE convoyed her to Milwaukee where she arrived on June 8 and discharged the remainder of her cargo.

The steamer HURON grounded on June 5 on the head of Stag island. She was bound with a cargo of coal for the Port Huron Coal and Dock Co. She was released on June 6 after being lightered of 800 tons of coal by the Reed Wrecking Co. of Sarnia, Ont.

The damage to the TREMAINE was the heaviest to any ship in an accident this year. It was determined when she was surveyed at the South Chicago yard of the American Ship Building Co. that over 50 plates were damaged, the majority of which must be renewed. Twenty days will be required to effect repairs.

## To Fit Out Nine Ships

About the middle of June orders were issued for fitting out nine ships of the Pittsburgh Steamship Co. These ships are, the E. P. THOMAS, MYRON C. TAYLOR, A. F. HARVEY, B. F. AFFLECK, E. J. BUFFINGTON, J. W. GATES, W. A. MCGONAGLE, J. P. MORGAN, JR.

and R. R. RICHARDSON. It is believed that these ships will begin operation early in July. When they do go into commission it will mean that not more than 20 ships will be engaged in the ore carrying trade. These include four of the M. A. Hanna fleet, one each of the Ford and Inland fleets and several of Cleveland Cliffs.

George A. Johnson has been appointed agent for the Goodrich Transit Corp. at Muskegon, Mich. He succeeds A. M. Lake who resigned to become a commercial agent for the company there.

## Large Tonnage Anticipated

Four million pounds of freight a month will be carried by the barges of the Inland Waterways Corp. when the Illinois waterway is completed, according to E. T. Harris, chairman of the waterway committee of the Illinois Manufacturers' association. This carrier now operates as far north as Peoria and it is hoped to operate into Chicago early next year. Anticipated shipments include 1,000,000 pounds a month southbound and 3,000,000 pounds monthly northbound. Movement to Chicago would consist principally of coffee from Brazil and other Latin American countries and Pacific coast canned goods. Other shippers estimate that the total freight handled by all carriers through the Illinois waterway eventually will reach 10,000,000 tons a year, due, in part, to the expected increase in manufacturing and the development of new industries in the Middle West as a result of the reduction in transportation costs.

## Passenger Ships Start

Passenger excursions started in June, with shipping officials fairly optimistic regarding business prospects for the season despite general conditions. Rates will continue around the 1931 levels, a sharp reduction having been made a year ago. It is hoped that considerable business will be supplied by individuals who formerly participated in more expensive vacations. From Chicago the Goodrich line continues its regular passenger service with two day boats daily to Benton Harbor and South Haven, Mich., and night boats to Holland, Muskegon, Grand Haven, Benton Harbor and South Haven.

The United States steamboat inspection service will soon issue new regulations and specifications with regard to marine boilers. There have been radical changes and rapid developments in the use of higher pressures and temperature.

## Will Try Shipping Grain Via Hudson Bay

A determined effort to test the Hudson bay route to Europe is to be made in July, according to the Canadian National railways. Arrangements have been completed for the shipment of two million bushels of wheat via this route from Churchill to Liverpool and the wheat is already moving over the Hudson Bay railway to Churchill where it will be stored in the government elevator until the arrival of the vessels which have been chartered for the sea voyage.

It is the first commercial shipment of wheat by this route. Last fall the Canadian government sent 250,000 bushels of grain overseas this way but it was entirely an experimental shipment. The vessels made a good voyage and reached Liverpool in record time. The shipments this summer, however, are to be made by the Continental Grain Co., New York, which maintains offices in Winnipeg. The wheat has been bought by this company from the Saskatchewan & Manitoba pool elevators, the division of purchase being for the purpose of establishing eastward and westward haulage costs and other data required if free movement of grain is to take place over this route.

## Ore and Coal Freights

Freight rates for ore on the lakes is the same as last year and for the last nine consecutive years, 70 cents per ton from the head of Lake Superior. This rate is per long ton. From Marquette the rate is 63 cents and from Escanaba to Lake Erie ports, 52½ cents per long ton. The rate from Escanaba to Lake Michigan ports is 42 cents.

The freight rates on coal to fast docks on Lake Superior are 35 cents per short ton; to fast docks at Milwaukee and Southern Lake Michigan ports it is 45 cents per short ton and 40 cents to ports on Lake Michigan north of Milwaukee.

Though the ore shipment has been very light, the coal movement is continuing at a fair rate. The total amount of bituminous coal carried on lake vessels for the season up to and including June 12, is 4,428,112 tons compared with 6,548,371 tons in 1931 and 10,922,966 tons in 1930 up to the same time.

A chemical company in Chicago recently received a shipload, 5600 tons, of phosphate rock from Florida, via barge canal and lake. This material formerly was moved by rail from Tennessee, but favorable, although possibly temporary, water rates induced the change.



# Equipment Used Afloat and Ashore

## New Fork Truck—Silencing and Washing Exhaust—Improved Crane —Steering System — Temperature Signal — Computing Stability

**A** NEW kind of paint, possessing it is said, remarkable properties, has been developed by the Eastern Mabelite Corp., 225 Mercer street, New York. This paint is made from a natural inert base pigment which is derived from an ore deposit located in Comanche county, Okla. and said to be the only one of its kind ever found.

This paint is an insulator, the manufacturer claiming that one thin coat will stop 1600 volts of alternating current. It is highly acid-resisting, heat resisting and has an abrasive quality. It is practically impervious to salt water and is a positive stop to electrolysis and corrosion. If the properties claimed for this paint can be demonstrated in practical use, it will apparently solve the problem of protecting ship structures from the effects of corrosion.

### New Type of Fork Truck

**T**HE lift truck and movable skid system for handling certain types of cargo on ships, docks and piers is gaining in favor. The usual platform skid however, requires a clearance of from 10 to 12 inches above the floor to accommodate the lifting platform of a lift truck. This loss of space is a serious drawback in connection with ships cargo.

The Elwell-Parker Electric Co., Cleveland, O., therefore has recently developed a new style of fork lift

truck shown in the accompanying illustration, which has as the supporting members of the skid, a fork with two or more prongs which takes the place of the ordinary lifting platform. With this fork type of truck the load is carried outside of the wheel base on the forks. As a result the arms can be dropped almost to the floor level, losing but two inches of space, or the thickness of the tines of the fork. The saving in storing each skid load is therefore 10 inches.

While it is possible to handle standard skid platforms by means of the same forks, in order to take full advantage of the possible savings, it is necessary to use a special type of skid or what might better be termed a pallet with the fork truck. These pallets may be made of wood with a two-inch clearance between "the table top" and the lower cross ties so that the operator of the truck can insert the chisel edge of the fork under the pallet. The operation of picking up a load of from 1000 to 6000 pounds is similar to that of a man picking up a light bundle of sticks to be carried in the arms against the chest.

It is interesting to note that the pallet suggested for use with this fork truck is almost identical in construction to pallets and sling boards for ship-side handling of cargo. The major difference is in the addition of hooks or rings fastened to the pallet corners for hooking to the ship's tackle.

### Exhaust Washing Silencer

**B**Y COMBINING a water scrubber and a silencer in one corrosion-proof unit, the Maxim Silencer Co., Hartford, Conn. has produced a compact, reasonably priced silencer that, not only makes the exhaust of the diesel engine quiet but also makes it sparkless and clean.

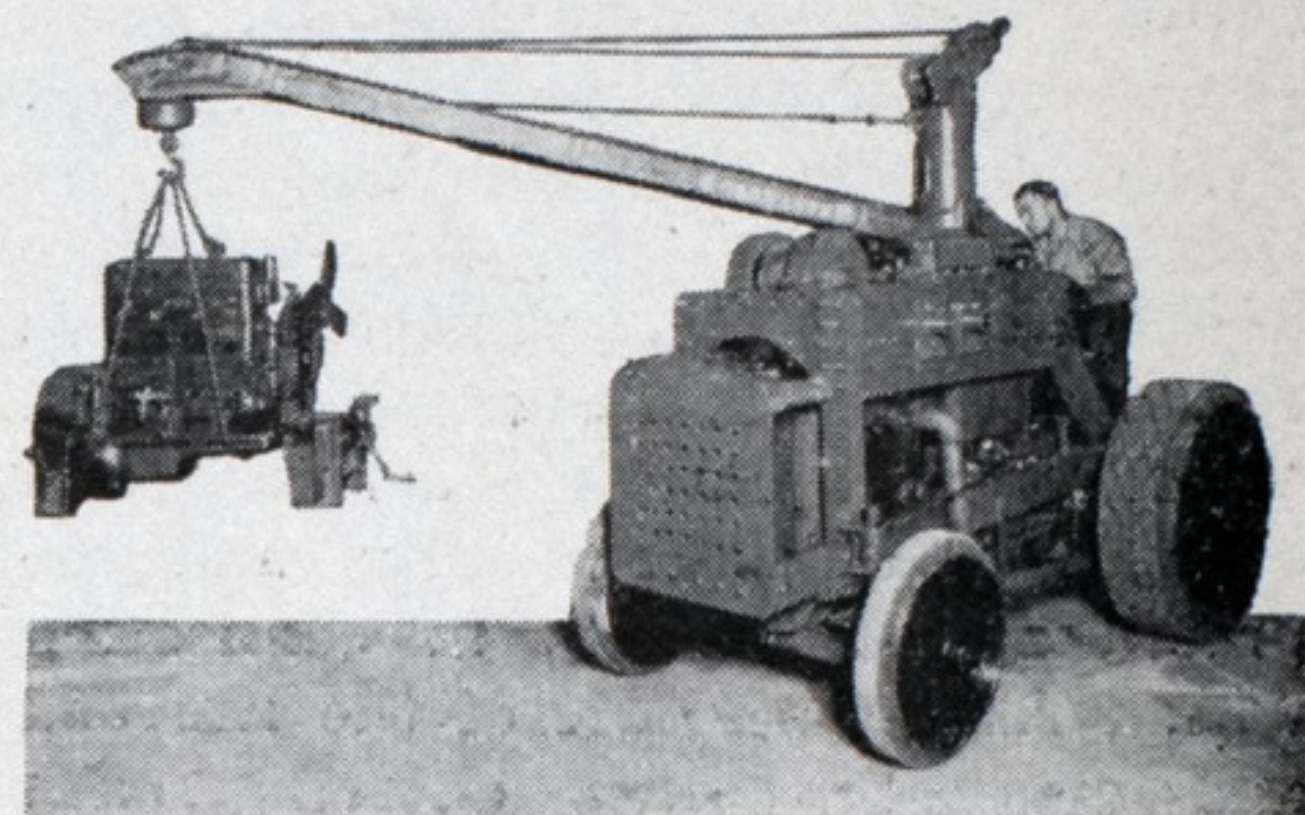
It is particularly recommended for installation on the exhaust of diesel engines used in tankers where sparks must be absolutely eliminated. It will make the exhaust of the diesel engine as inoffensive, as far as sparks and dirt are concerned, as the exhaust of a gasoline engine.

### Improved Crane Unit

**T**HE crane unit, known as the "loadmaster" manufactured by Bucyrus-Erie Co., South Milwaukee,

Wis., is now available either with Case or McCormick-Deering power. The capacity of this crane has been increased to 4500 pounds.

With its increased capacity it has a wide variety of uses in connection with handling cargo on docks and in load-

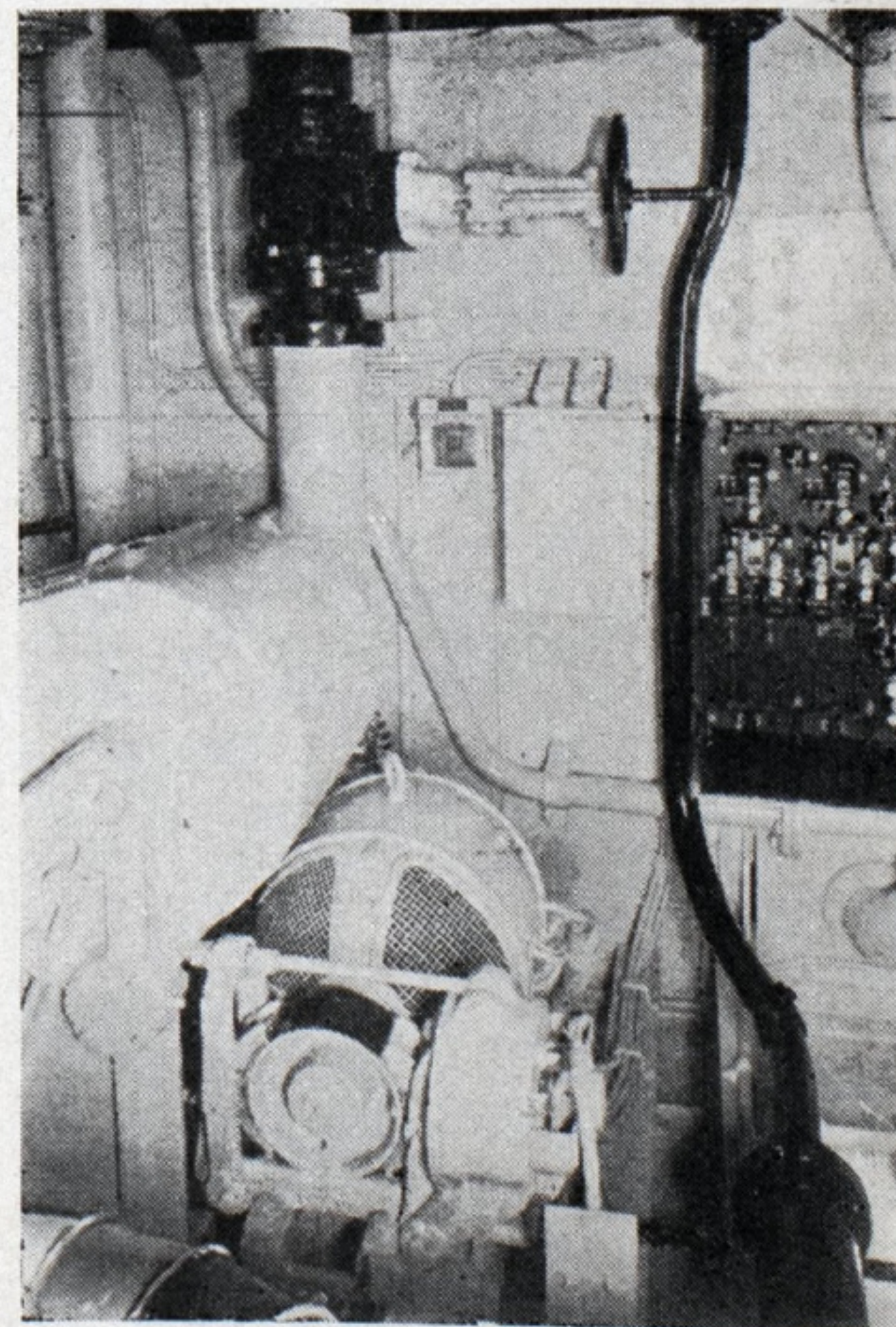


*Crane for Lifts up to 4500 Pounds*

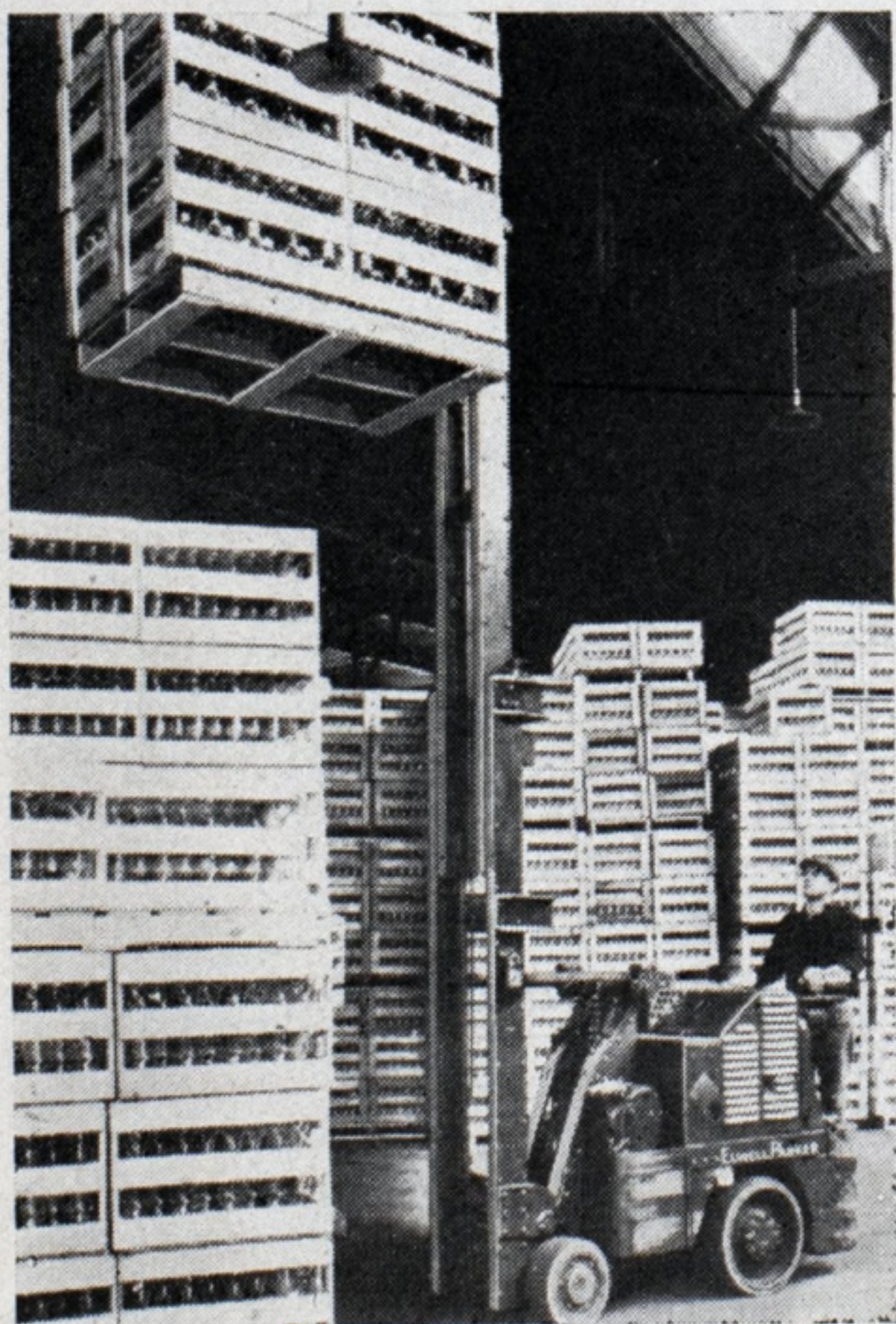
ing and unloading ships. It can be used as a stationary revolving boom crane, as a crane traveling with its load, or as a tractor. Its mobility, compact design and items of special equipment make it particularly handy for many tasks on the dock or pier. It lifts, swings and carries loads to points where needed.

### A New Steering System

**A** NEW steering system, said to combine all the advantages of electric steering, with the reliability of handoperated gear has been developed by the Sperry Gyroscope Co.,



*New Electro-Mechanical Steering System installed on the John J. Harvey*



*Fork Lift Truck, with Telescoping Uprights, using a special "pallet" skid*



Inc., Brooklyn, N. Y.

The new steering gear is called the Sperry electro-mechanical steering system. It is a mechanical steering system in which an electric motor of the required size provides the actual power for moving the rudder so long as electrical supply is available. The steering wheel is always mechanically connected to the rudder. In case of power failure the motor is automatically and instantly disconnected from the system, allowing the helmsman to continue steering, through the same wheel and shafting, without de-clutching or throwing switches. When the power is restored the motor is automatically cut in and electric steering is resumed.

This simple and reliable system is the result of the Sperry company's many years of experience in building automatic steering controls for vessels of all types. It is now in use on vessels of the United States coast guard, The United States army and the New York fire department.

Among the vessels on which installations have already been made are: The new fireboat for the City of New York, the JOHN J. HARVEY; WALTER WYMAN, United States Public Health service; and on the coast guard patrol boat THETIS and six sister vessels of her class.

## A Temperature Signal

A new temperature signal device for determining the temperature by means of electric lights, known as the "Thermo-Tel" has been developed by the Uehling Instrument Co., Paterson, N. J. The instrument consists of different colored electric lights, actuated by changes in temperature.

When the temperature is within the limits for which the instrument is set, a white light will illuminate. When the temperature is above the limits, a red light will illuminate. When the temperature is below the limits, all lights will be out.

Each "Thermo-Tel" signal is set for the particular limits desired. For example, 190 degrees and 193 degrees. A glance at the colored lights will definitely determine whether the temperature is high, low or within said predetermined limits. If desired, the signaling lights may be located at any distance from a point, the temperature of which is being observed.

This temperature signal, according to statement by the manufacturer, is accurate to within one-tenth of one degree Fahrenheit and can be read at a distance of 200 feet or more. It is claimed to be entirely reliable and is finding many applications in industry. It is also suitable for marine use.

## Boston to Antwerp

The American Diamond lines, operator of fast American flag freight services to Antwerp, through their lo-

cal agents, Peabody & Lane Inc., 110 State street, announce an improved service from Boston to Antwerp, beginning with the steamer NEW BRITAIN from Boston, June 27. This new schedule of the American Diamond Lines offers to New England exporters and importers a much faster and more frequent service than they have heretofore enjoyed.

## New Device Computes Ship's Stability

An electrical device which acts as a stability meter, was invented by J. L. Wilson, assistant chief surveyor of the American Bureau of Shipping.

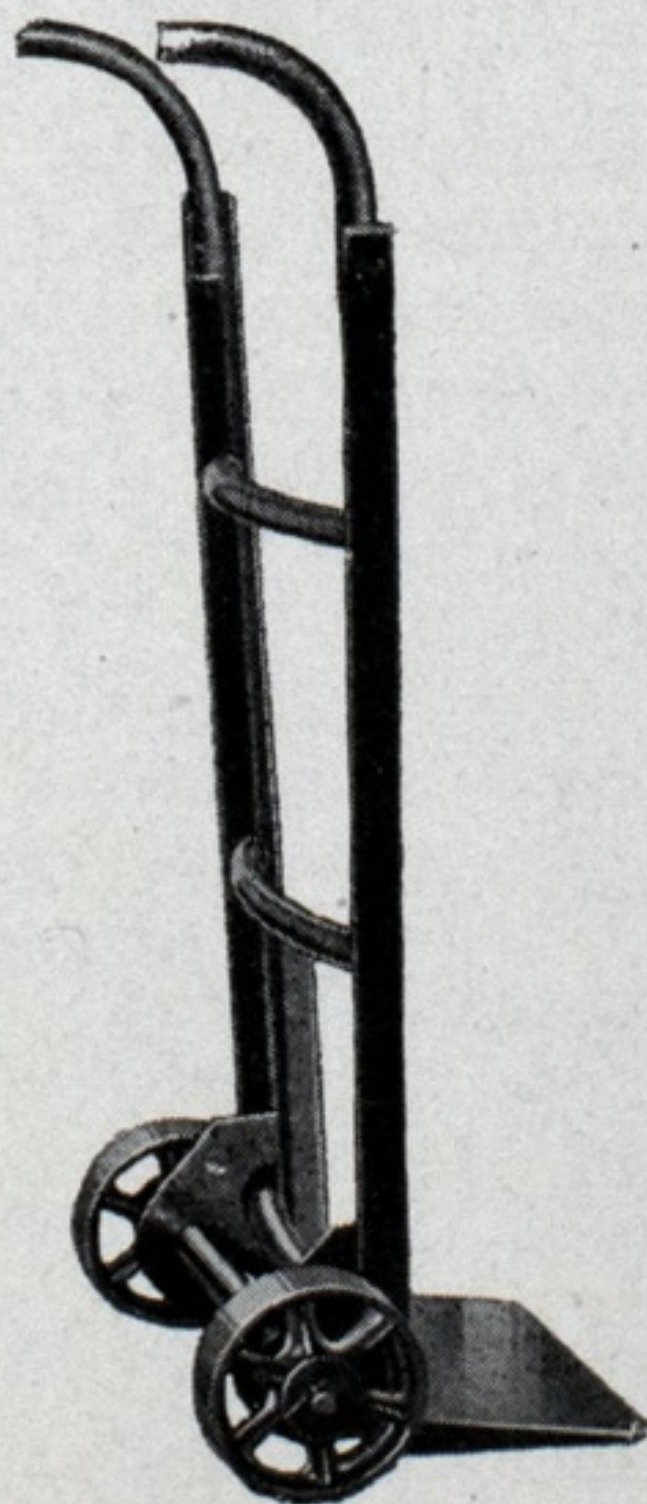
The stability meter employs a gyroscope and pendulum and by means of electrically performed calculations indicates on a dial the actual metacentric height in inches of the vessel for which it is calibrated and upon which it is installed. The metacentric height is the measure of a ship's stability.

Heretofore, the inventor explained, the only way this important factor of a vessel's safety could be determined has been by inclining her while in port and performing a series of involved mathematical calculations. This method, the only one in use up to the present, involves the necessity of assuming purely hypothetical loading conditions and the provisions of large margins of safety at the expense of carrying an unnecessary amount of ballast. Also, he pointed out, there is danger from too great stability, because in such cases the period of a ship's roll can approach the period of the waves, with a cumulative effect which is believed to have been the cause of the capsizing of a number of ships.

By means of the stability meter, which functions when a ship is at sea and rolling at least 3 degrees, he said, errors in loading as well as the constant change of stability coming from the consumption of fuel can be exactly compensated for by the admission of the proper amount of water ballast.

## Stellited Nose On Truck

The Service Caster & Truck Co., Albion, Mich., has put on the market a hand truck with a stellited nose. Stellite is an alloy which is very hard, thus this truck will stand wear much better.



## Boston Traffic Increases

Increase in foreign commerce and passenger traffic from foreign countries at the Port of Boston during the five months ending June 1 in comparison with the same period last year, is shown in Maritime association figures. This year there arrived from foreign countries 8538 passengers, or 1135 more than the corresponding five months in 1931. The greatest increase was in the traffic from West Indies and Bermuda, the figures being 3392 this year, against 1744 last year. There was a falling off of 254 in the passenger arrivals from European countries, the figures showing 655 this year, against 909 last year.

During the five months this year there arrived from foreign countries 575 steamers, 47 schooners and gasoline boats, a total of 622, against 558 steamers and 49 schooners and gasoline boats, a total of 607, for the same period last year. May showed a falling off of eight steamers and an increase of three schooners compared with a year ago.

## Training Ship Cruise

The Massachusetts nautical training ship NANTUCKET sailed May 21 on its annual summer cruise during which the 118 student cadets aboard will receive training in seamanship, navigation, engineering, upkeep of the ship, knots and splicing.

Lieut. Otto Schreuder of the Belgian navy was on board as a passenger. Of the four nautical training vessels in the United States, he chose the NANTUCKET in order to make observations which he will relay to the Belgian navy for use on their training vessels.

Capt. Clarence A. Abele, former chief of staff at the Boston navy yard, is in command. He retired from the navy to take command of the NANTUCKET, succeeding Capt. Armistead Rust, U. S. N., retired.

## Closing Clinton Plant

Plans were completed recently for the closing of the Clinton plant of the Todd Shipyards Corp. and the transfer of its drydocks, floating equipment and machinery to the Tebo plant, foot of Twenty-third street, Brooklyn, N. Y.

With this additional equipment this yard, which will be known as the Todd Dry Dock Engineering & Repair Corp., will be one of the most modernly equipped ship repair plants in the harbor. Its four floating dry docks will provide lifting capacities up to 8500 tons. It will have complete facilities for handling every class of ship repair work on vessels up to that size.



# Personal Sketches of Marine Men

John D. Reilly, Elected President, Todd Shipyards Corp.

By Ben K. Price



**B**EGINNING his connection with the ship repair industry 25 years ago, at the age of 18, he has been actively associated with it ever since.

**I**N AN unusually close contact for many years with the late William H. Todd his qualities of real leadership were repeatedly demonstrated.

**H**IS unanimous election as president is due to confidence in his integrity, ability and thoroughly grounded knowledge of the company's affairs.

**B**Y VIRTUE of his recent appointment as president of the Todd Shipyards Corp., 25 Broadway, New York city, John D. Reilly at 43 becomes one of the youngest major executives in the shipbuilding and ship repair industry and by training, to say nothing of actual achievement, he should prove one of its ablest. For almost 25 years Mr. Reilly had been in close association with the late William H. Todd, whom he succeeds, and no man in ship building could have thus been more favored, and, it might well be added, no man could have been one whit more deserving.

For witness Mr. Reilly's rapid rise from an office secretary through various stages to director and executive vice president and finally to the head of possibly the largest organization of its kind in the world, the choice of Mr. Todd before he died, of the members of the Todd family who are large stockholders, and the unanimous choice of the directors of the corporation.

This association with Mr. Todd gave Mr. Reilly not only a thorough grasp of the purely managerial problems of the corporation, but carried him into the realm of finance and at the same time provided him with the benefit of an early practical mechanical training which the present incumbent never had.

Mr. Reilly was born Aug. 1, 1888, in Yonkers, N. Y., where he has always resided. Graduating from a local high school and spending one year in a bank, he became secretary to J. N. Robins, founder of the company which then bore his name and which later became the nucleus of the amalgamation which later became the Todd Shipyards Corp. This was in 1907, his first contact with the shipbuilding industry and a contact which he has constantly maintained through his affiliation with this one organization.

It was two years later, 1909, that he, upon the retirement of Mr. Robins, became directly associated with Mr. Todd. Following a meteoric rise, Mr. Todd just became president—president at the age of 45, incidentally—and Mr. Reilly was given a position similar to the one he held with Mr. Robins.

His association came in time to witness one of the most romantic developments in his branch of the ship-

ping industry, and possibly one of its most dramatic instances, namely, in 1915, when Mr. Todd, taking with him 100 of his workers, blocked the sale of the company to foreign interests and acquired control. The company in 1911 had been reorganized as the Robins Dry Dock & Repair Co., with the Clyde interests in control and they had later offered the property to an English buyer for \$7,000,000. It was then that Mr. Todd, taking with him his 100 workers, formed the William H. Todd Corp. and developed a purchase plan, calling for the payment of the same amount on long installments, a proposal that was finally accepted, with the property involved the largest of its kind around New York.

Business flourished and the following year, 1916, the Todd Shipyards Corp. was formed to take over the Tietjen & Lang Dry Dock, Hoboken, N. J.; the Seattle Construction & Dry Dock Co., Seattle, Wash., and the Quintard Iron Works, N. Y. This turnover paid each of the 100 partners a substantial cash dividend and 1½ times his holding of stock in the old company.

Mr. Reilly, now assistant to the president, was to see much further expansion, not only in point of growth of existing properties, but in the acquisition and formation of additional plants, including the Todd Dry Dock Engineering & Repair Corp., Brooklyn; Todd Engineering Dry Dock & Repair Co. Inc., New Orleans; Todd Shipbuilding & Dry Dock Co. Inc., Mobile, Ala.; Todd Dry Docks Inc., Seattle, Wash.; and the Todd Oil Burners Ltd., London, England.

In all of these enterprises, Mr. Reilly was destined to take a constantly increasing responsibility. In 1920 he became a director of the Todd Shipyards Corp. and in 1929 a vice president of the subsidiary companies at Seattle, Wash., Mobile, Ala., and New Orleans.

The new president is pleasant, approachable, with the ruddy face and blue eyes so characteristic of the race of his ancestors; he is of average height and of rugged build. He is a member of the Society of Naval Architects and Marine Engineers, the Maritime Exchange of the Port of New York and the American committee of Lloyd's, this latter being a relatively new affiliation.



## Arc Welding Used

(Continued from Page 26)

the instructions of the electrode makers, sufficient skill to maintain the required arc and to deposit material at the proper speed, as well as such knowledge of temperature effects as will enable him to realize the value of small runs in aiding heat diffusion, of proper distribution of weld material in reducing distortion, and the need to adhere rigidly to the welding methods prescribed by overseers who should know more than he does.

In considering the following matter it has to be remembered that classification societies are chiefly interested in results, and their application of knowledge of achieved results to the regulation of future results, if expert in one sense, is not and cannot be expected to be expert in the particular sense of an expert chemist, metallurgist, or electrician. Much of what follows may be regarded by the latter as common knowledge, but it may not be familiar to those about to use new "material" in shipbuilding. For that purpose it seems necessary to get away from the laboratory and get down to control of work done by ordinary skilled workmen in shipyards and repairing shops, by methods based on results achieved by themselves. Investigations on this basis show that the key to sound work is proper relationship between current, size of electrode, mass of material adjacent to the joint, and rate of deposition from the electrode. It is not outside the bounds of practical politics for workmen to control the electric current and to ascertain, by experiment, the best rate of deposition, i.e. to make and maintain the best length of "run" from a known length of electrode.

The importance of length of run in relation to the magnitude of temperature effects is made easily visible by taking two plates of the same thickness and depositing on one the same quantity of material in half the length of the deposit on the other.

Perfect fusion at the corner of a triangular weld is a first essential, and experiments show that the possibility of bad fusion at the corner or bottom of a weld is accentuated by the use of too large an electrode.

These facts support conclusions which have been advanced by experts, that the best length of run to be deposited from the average heavily coated 18-inch electrode can be specified, and that it should be experimentally determined for each type of electrode before use.

Making a number of relatively long straight runs to build up a weld, and cleaning away all slag before one run is superimposed upon another, greatly facilitates judgment as to whether a weld is sound

or not.

In view of the probability that no fusion process can ever avoid all strain due to contraction, weld material which is also subject to alternating strains must be ductile to be durable. It can be assumed that weld material which shows 16 per cent elongation under test will provide reasonable ductility in a joint, but however closely the specified tensile and elongation tests may approximate to those of the steel to be joined, it does not necessarily follow that satisfactory tests of the relatively large masses of weld material needed for the preparation of a standard test piece, form a guarantee that an ordinary joint made with that material will possess all the characteristics of rolled steel. Whether the test of material has given the desired result or not, it is therefore necessary to carry out further tests to prove by conclusive "working" examples and tests that the material is sufficiently ductile to withstand alternating strains when used in ordinary welds. The physical tests to be imposed on welded test pieces should therefore take account of this.

### Regulations for Good Welding

It is not the proper business of a classification society to specify any particular electrode, current, or other specialist's matter, but investigation on the foregoing lines has shown that it is possible to lay down regulations which will produce good shipyard welding, provided the workmen adhere rigidly to the conditions laid down in preparing the acceptance tests, and the acceptance tests themselves are made in the shipyard by shipyard operators.

The great problem of distortion, however, has to be faced and overcome. Fortunately, experience has shown that it can be overcome by similar tactics to those adopted in riveting, even when surfaces of large area have to be welded, and that welding of curved surfaces can be carried out successfully.

It cannot be too strongly emphasized that practical and commercial success in the application of electric arc welding depends upon utilizing the possibilities of fabrication before erection, overcoming the difficulties of erecting and holding up by new methods, and designing the structure so that arc welding is done in the easiest and therefore the best way. It should be taken as axiomatic that no joint in a main structural member should require to be welded overhead except for the reinforcing bead at the bottom of the butt weld—an arrangement which is quite within the possibilities of design.

The question of "fitting" or bringing together various fabricated portions of the hull requires careful thought, and in this connection shipbuilders may learn something from

bridgebuilders. It may be found that the oxy-acetylene burner can be usefully employed where one side of a "part" has been left full for "fitting," so that there is an overlap between two parts, in which case the two edges are cut out with the burner so that they fit to the required degree and welding can then be done without further dressing of the edges.

Inspection is the first, last, and most important factor in the success or failure of electric welding, and, as the process of welding is continuous, a great responsibility is thrown upon the management of the shipyard in order to ensure rigidity in this essential. It has been stated that in some works there is one skilled inspector to every batch of six skilled operators, and that gives a fair indication of what must be faced until the work of training and the number of trained men is such that the work can be relied upon in the same fashion and under the same degree of supervision as riveting.

## Patrol Fleet Completed

(Continued from Page 21)

Electric Storage Battery Co. make.

The fire extinguishing system is comprised of six stationary 50-pound Lux cylinders for the engine room and operated by levers on the main deck. In addition, there are four portable Lux extinguishers, one in the deck house passage, two in the engine room and one in the galley. These are practically duplicated by Dayton hand extinguishers and there are also two 2½-gallon Fyr-Fyter extinguishers aboard.

The windlass, built by Hyde Windless Co. is designed to lift a 900-pound anchor and 45 fathoms of chain at the rate of six fathoms per minute. Power is supplied by a General Electric, 7½ horsepower motor.

The blower for bilge ventilation was built by the American Blower Co. and has a capacity of 320 feet per minute, driven by a Diehl 1/6 horsepower motor turning at 1600 revolutions per minute. The three blowers for ventilation of living spaces are of the same manufacture and have a capacity of 1200 feet per minute, driven by a Diehl ¾ horsepower motor.

Refrigerators, one of 10 cubic foot capacity and the other of 17, were built by Westinghouse. The propellers, 62 x 53 inches were manufactured by Hyde and the air whistle was supplied by Allan Cunningham.

The mechanical telegraphs were supplied by Chas. Cory & Son Corp.

These seven boats have been assembled as an operating fleet, berthing at the coast guard base at Stapleton, Staten Island, N. Y. All of them have been placed in service and operate independently as a new unit of the United States Coast guard service.

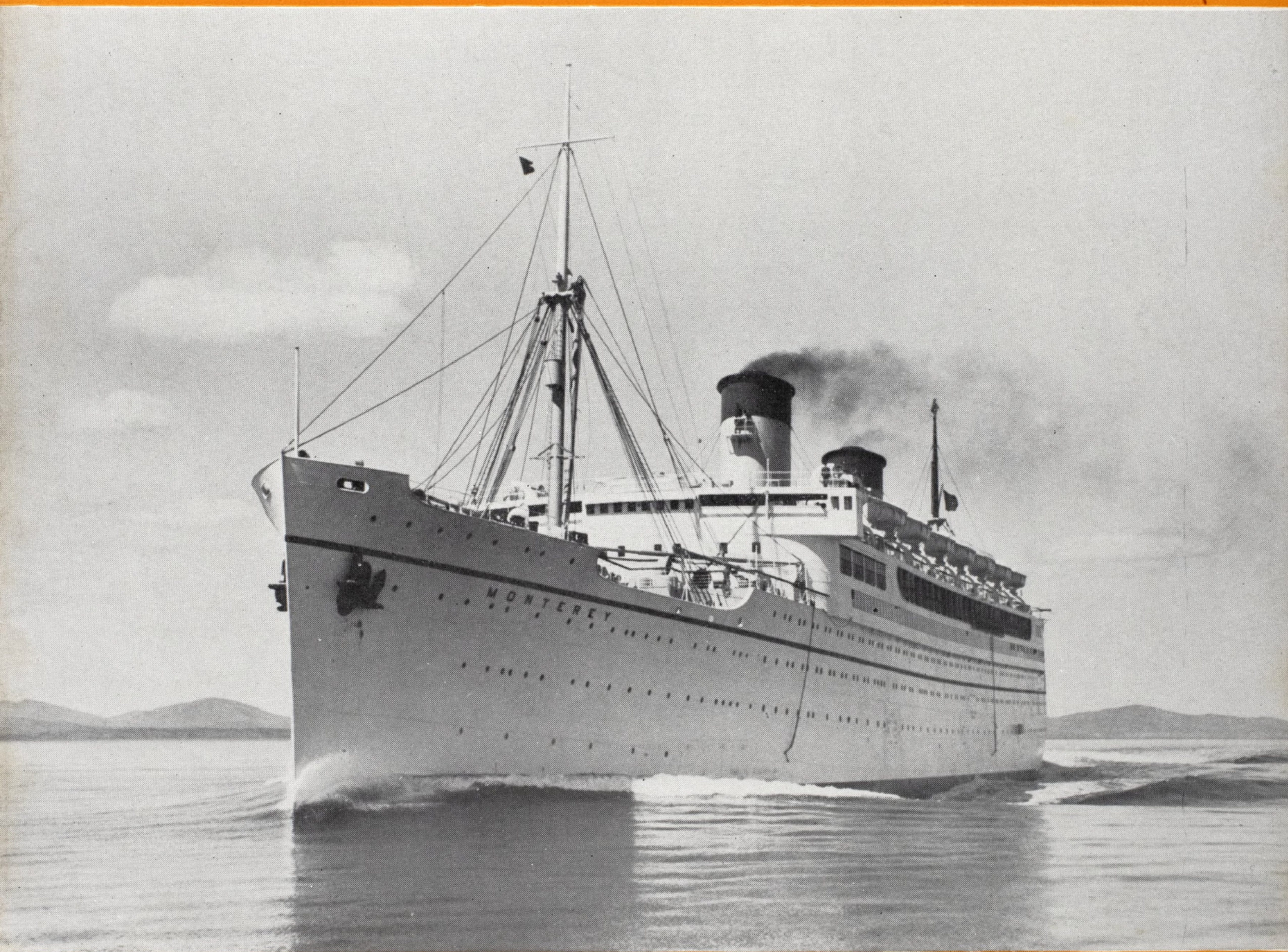


# Marine Review

Reg.  
U.S.  
Pat.  
Off.

*The National Publication Covering the Business of  
Transportation by Water*

**July, 1932**





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# Where are they going? What will they bring back?



Proceeding to sea from San Francisco: S.S. President Cleveland (Dollar Line)  
S.S. Malolo (Matson Lines), S.S. Virginia (I. M. M. Lines)

**T**ODAY fast freight vessels carrying the American flag sail to all the leading ports of the world. They offer greater service now than ever before. They provide speed and safety and give you the full benefit of American efficiency in handling, loading and dispatching. They will protect and develop your foreign trade.

Patronize them and They Will Bring You Back New Business.

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## NEW YORK SHIPBUILDING COMPANY

Main Office and Yard:  
CAMDEN, N. J.

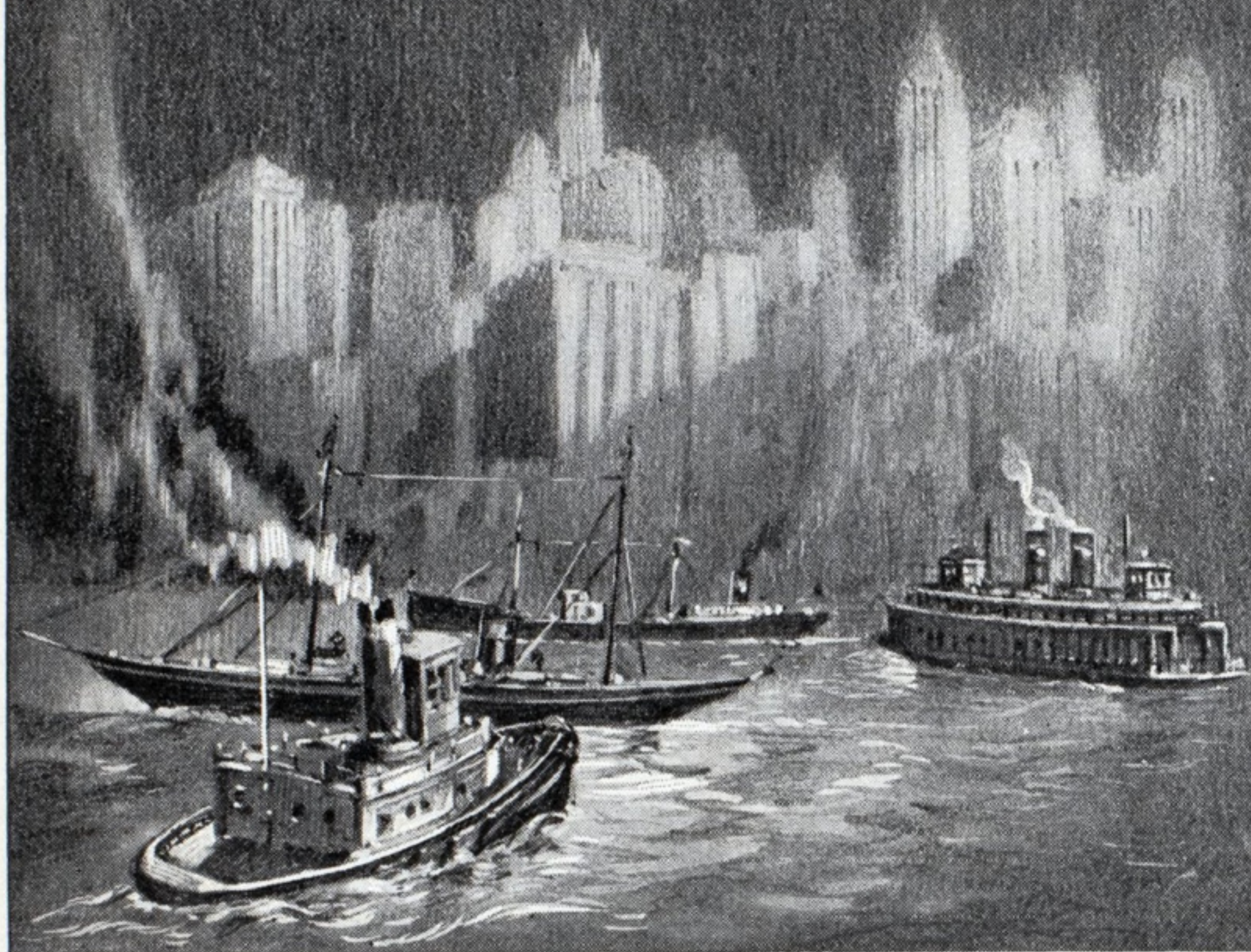
New York Office:  
420 LEXINGTON AVENUE



# Boilers of Standard and Special Design

for

Floating Grain Elevators  
Great Lakes Freighters  
Floating Power Plants  
Coast Guard Cutters  
Floating Dry Docks  
Lighthouse Tenders  
Excursion Steamers  
Passenger Ferries  
Army Transports  
Passenger Liners  
Aircraft Carriers  
River Towboats  
Cargo Liners  
Battleships  
Destroyers  
Car Ferries  
Fireboats  
Dredges  
Cruisers  
Tankers  
Yachts  
Tugs



## BABCOCK & WILCOX *Marine Products*

Water-Tube Boilers  
De-Superheaters  
Superheaters  
Economizers  
Air Heaters  
Oil Burners  
Stokers  
Refractories  
Oil Separators  
Feedwater Regulators  
Water-Cooled Furnaces  
Pulverized-Coal Equipment

IN over forty years of progressive engineering service to the Marine Industry, The Babcock & Wilcox Company has built boilers for steamships of every class . . . B & W Boilers which have become the standard design for ships ranging from river towboats to ocean liners, and boilers of special design when required.

The standard B & W Boiler fulfills the usual requirements of economical, efficient, and reliable operation . . . and special designs are developed to effectively meet unusual conditions of arrangement and operation. Both demonstrate the ability of the Company to meet *every* requirement in boiler equipment.

The services of this organization, noted for specialized experience and sound engineering, are at the disposal of those requiring the usual or the unusual in boiler design.

THE  
**BABCOCK & WILCOX**  
COMPANY  
85 LIBERTY ST. NEW YORK, N. Y.



M-13





A

NEW

# STEERING • SYSTEM •

**A**T LAST, a Steering System with all the ease of operation of electric gear and all the reliability of hand-operated gear! It is primarily a mechanical steering system in which an electric motor of the proper size provides the actual power for moving the rudder so long as electrical supply is available.

The steering wheel is always mechanically connected to the rudder. In case of power failure the motor is instantly disconnected from the system, allowing the helmsman to continue steering through the same wheel and shafting, without de-clutching or throwing switches. When the power is restored the motor is automatically cut in and electric steering is resumed.

This simple and reliable system, now being used by the United States Coast Guard, United States Army and New York Fire Department, is the result of our many years of experience in building automatic steering controls for vessels of all types.

If you are planning a vessel up to a size that could be steered manually in an emergency, write for full data on this remarkable contribution to safety and efficiency.



**SPERRY GYROSCOPE CO., Inc.**  
BROOKLYN — NEW YORK

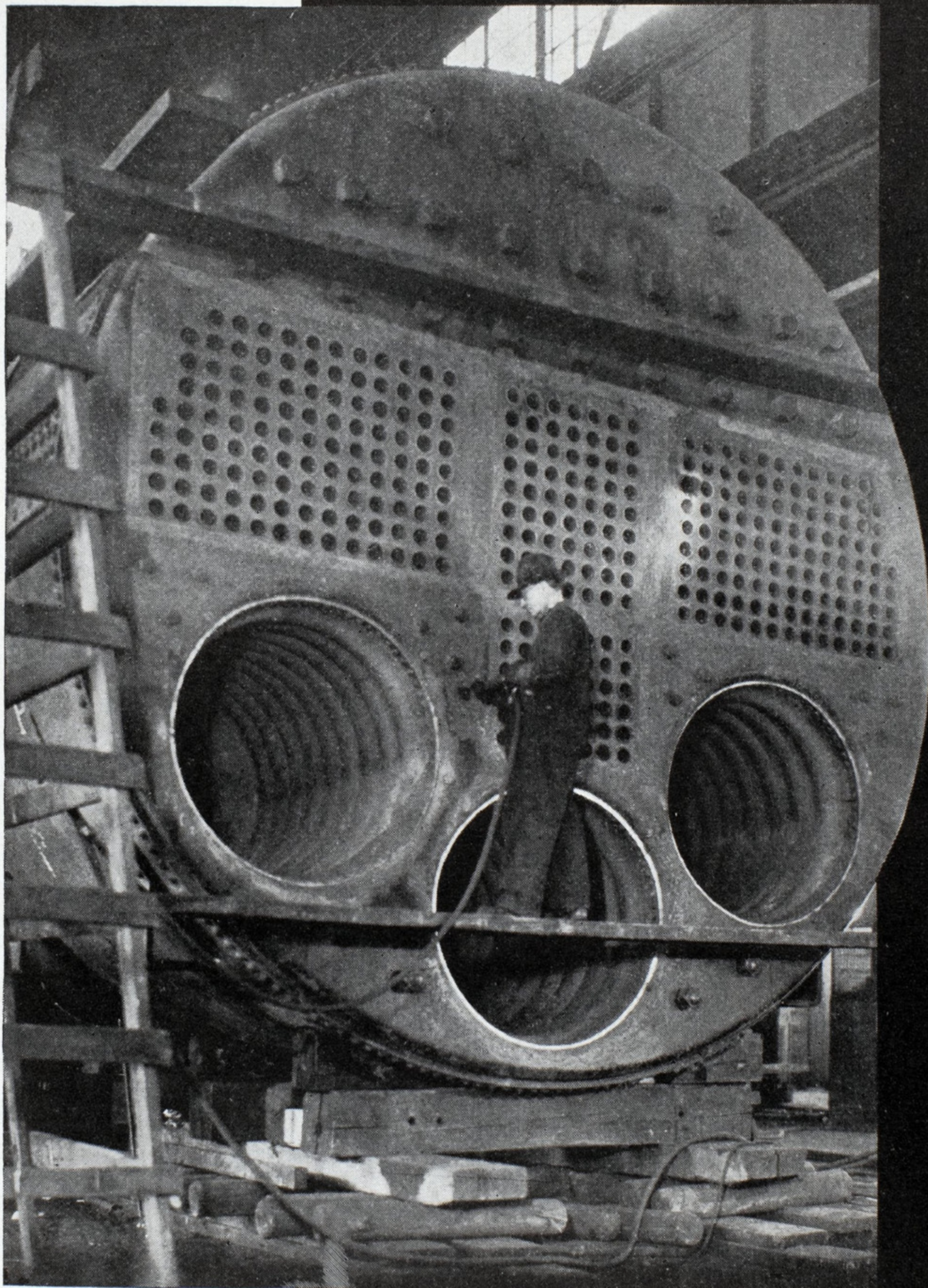


# Get Those Improvements Out of Your Mind And Into Your Ships!

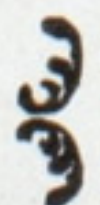
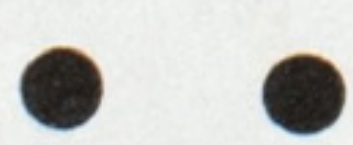
● **I**t is clearly sound business judgment to have those ship repairs or alterations, which you have planned to have us make for you sometime, made by us *now*!

Many ships are still in winter berths as we write. A good time for repairs—no interference with traffic; or loss of precious cargo hauling opportunity. Materials are now lower in price. Labor does a better job, quicker. Surely it is good business to take advantage of this opportunity.

A little job left too long often becomes a *big* job. Let your repairs or alterations be made swiftly, dependably, economically, at one of American's five completely equipped ship yards *now*! Obey that impulse!



## The AMERICAN SHIP BUILDING CO.



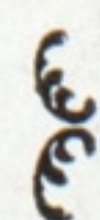
CLEVELAND  
American Ship  
Building Co.

LORAIN  
American Ship  
Building Co.

BUFFALO  
Buffalo Dry Dock  
Company

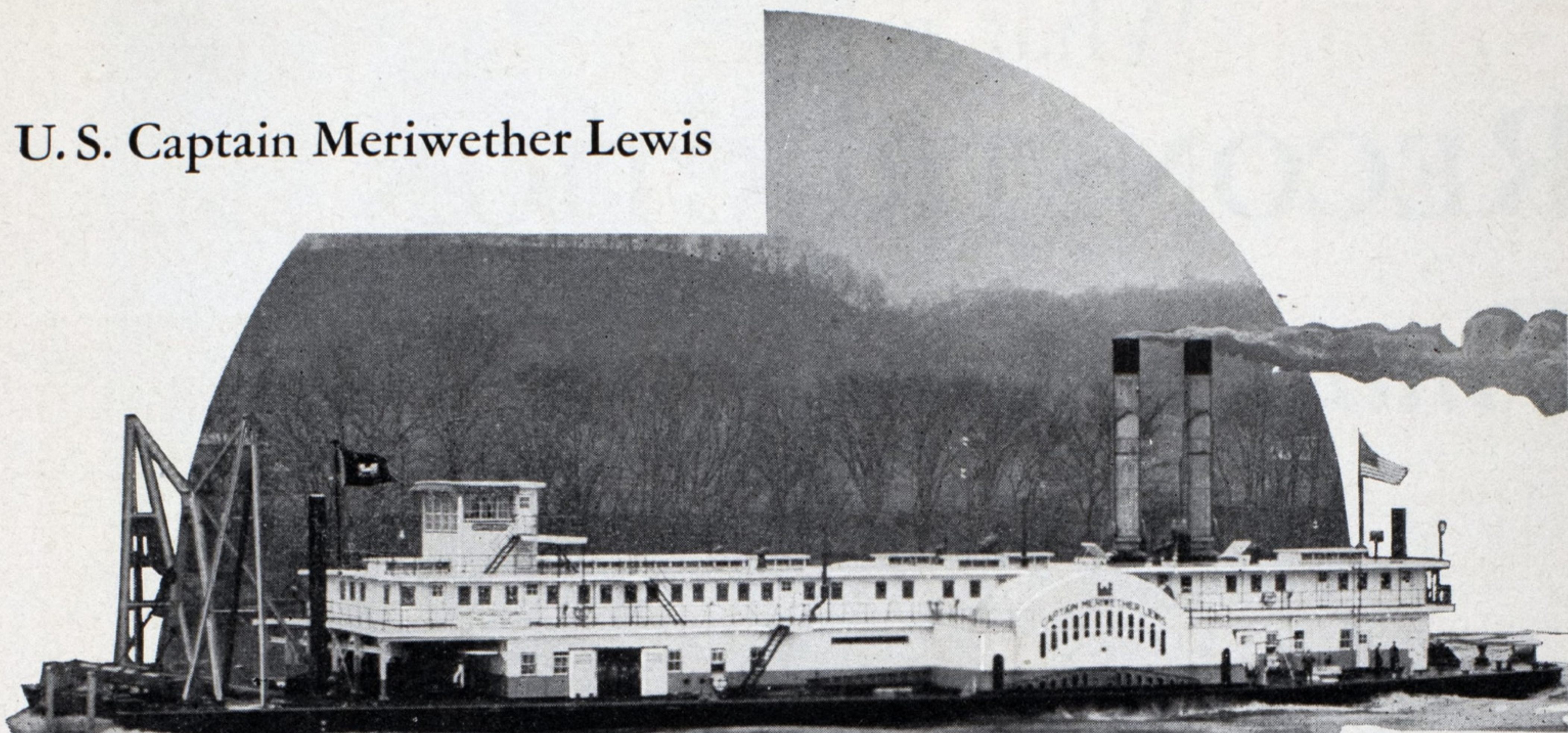
SOUTH CHICAGO  
Chicago Ship  
Building Co.

SUPERIOR  
Superior Ship-  
building Co.

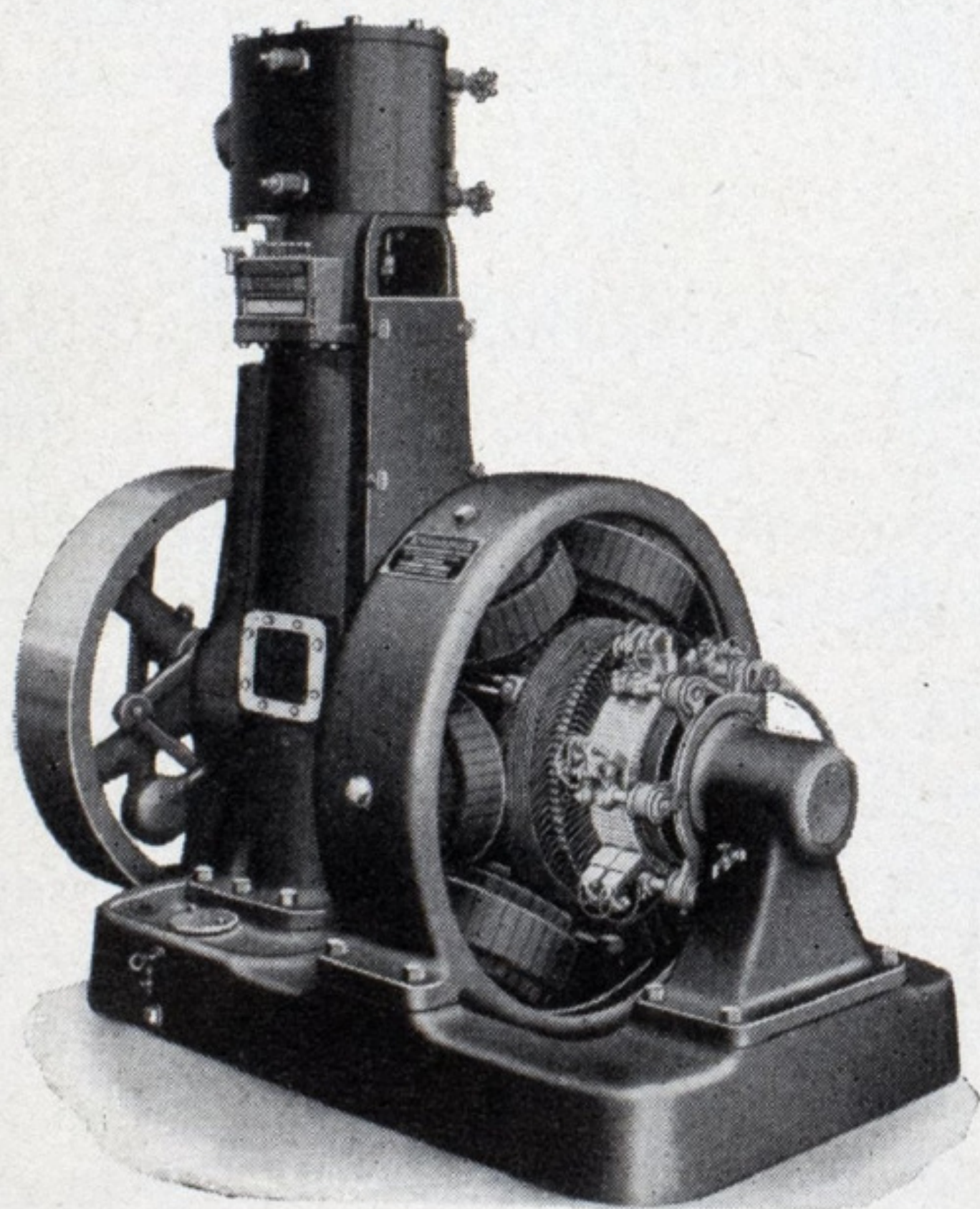




U. S. Captain Meriwether Lewis



## *This Powerful Dredge* **is TROY-ENGBERG** *Equipped . . . . .*



*Troy-Engberg Marine Generating Sets are furnished in both Direct and Alternating Current in Capacities from 3½ to 150 Kw.*

"U. S. CAPTAIN MERIWETHER LEWIS" is the 34 inch U. S. Engineer pipe line dredge built for the Kansas City district by Marietta Manufacturing Company. A duplicate of this dredge, the Captain Clark, is now nearing completion. Both of these powerful craft are equipped with Troy-Engberg Marine generating sets.

The superiority of Troy-Engberg Marine generating sets is constantly receiving endorsement by "installation." Over forty years of marine experience is responsible for the perfection of the many features for economy and operation that satisfy the most critical users.

Their low *maintained* steam rate cuts cost and keeps it down.

Generous design and self oiling features guarantee long life. Operation without oil leakage and constant voltage are valuable features.

Troy-Engberg Marine generating sets *are* superior equipment. Valuable data on Marine generating sets is available to you for the asking. Write us for it.

TROY ENGINE & MACHINE COMPANY  
2250 Railroad Avenue      Troy, Pennsylvania

# TROY-ENGBERG

MARINE GENERATING SETS, DC OR AC • GENERATORS • STEAM ENGINES



# What is the RECONSTRUCTION Finance Corporation Doing?

It is acting as a great discount bank, and is loaning over \$7,000,000 a day

★ THESE loans are made to every part of the United States through commercial banks, savings banks, trust companies, joint stock land banks, Federal intermediate credit banks, agricultural credit corporations, live stock credit corporations, and to the railroads, building and loan associations, mortgage loan companies, and insurance companies.

The applications come in through the 33 branches and are carefully inspected locally as well as in Washington. But action is rapid, and one day's operations will take in many of the above avenues of distribution in most sections of the country.

The amounts loaned vary from a few thousand dollars to several millions, and due consideration is given the necessity of each case.

## WHAT ARE THE CHANGES IN THE ECONOMIC PICTURE?

THROUGH the Reconstruction Finance Corporation, the enlarged powers of the Federal Reserve System, the campaign against hoarding, and the United Action for Employment, great fundamental changes have developed.

Beginning in the summer of 1931 with the financial crisis in Germany, followed by the suspension of gold payments in England, a tremor of fear went through the entire world. The shock manifested itself in America by enormous gold withdrawals on the part of foreign central banks which had been leaving their money on deposit with us for years. Bank failures increased rapidly in this country as a

result of the financial excitement, which encouraged the hoarding of currency and the sale of securities.

*This picture is now changed.* Money is being returned to circulation. The resources of banks that failed in March are about equalled by the resources of the banks that reopened. People are becoming impatient with anything which is obstructing the return to normal trade and normal living. The dollar is able to buy more in merchandise, services and securities than it has for many years. The *active dollar* is the only dollar that is valuable, and it is now putting its more slothful neighbor to shame.

*"As the most nearly self-contained nation, we have within our own boundaries the elemental factors for recovery."*

★ This advertisement is printed by Marine Review without cost, on the recommendation and in cooperation with the committee on Unemployment Plans and Suggestions of the President's Organization on Unemployment Relief. ★





*Westinghouse Broiler on duty aboard the Ward Liner Morro Castle.*

# GALLEY EQUIPMENT

*that has passed*

## ITS SEA-TRIALS ⚓ ⚓ ⚓

**W**ESTINGHOUSE Galley Equipment has withstood the ruthless action of salt laden air aboard ship under all conditions of trying weather from the humid tropics to the drenching fury of storms in the North Atlantic, establishing itself high in the favor of marine men everywhere for its sturdy fitness and sailor-like behavior. It has passed its sea-trials.

The Westinghouse Electric Broiler is outstanding. The broiling grid of oval steel bars runs on rollers, is counter-balanced for easy operation, and is raised and lowered by a handle at the side.

Tile reflectors over independently controlled heating elements above the grid reflect the heat downward.

A heavily insulated, rust-resisting Au Gratin oven located above the broiling area efficiently utilizes heat rising from the grid, while beneath the broiling area is a roasting oven identical with that furnished on standard four-foot section ranges.

The broiler unit has a rigid structural steel frame, firmly braced, and welded at the joints, with a body of heavy gauge sheet steel.

Broilers and other Westinghouse galley equipment have shipped aboard vessels of every type, and wherever they take over the cooking tasks Charlie Noble is up against it for a smoke, because Electric heat is clean, fireless and smokeless.

### ARE YOUR GALLEYS *modernized?*

Electric cooking equipment is cleaner, safer, more economical, more compact, and cooks food more deliciously than any other cooking equipment known.

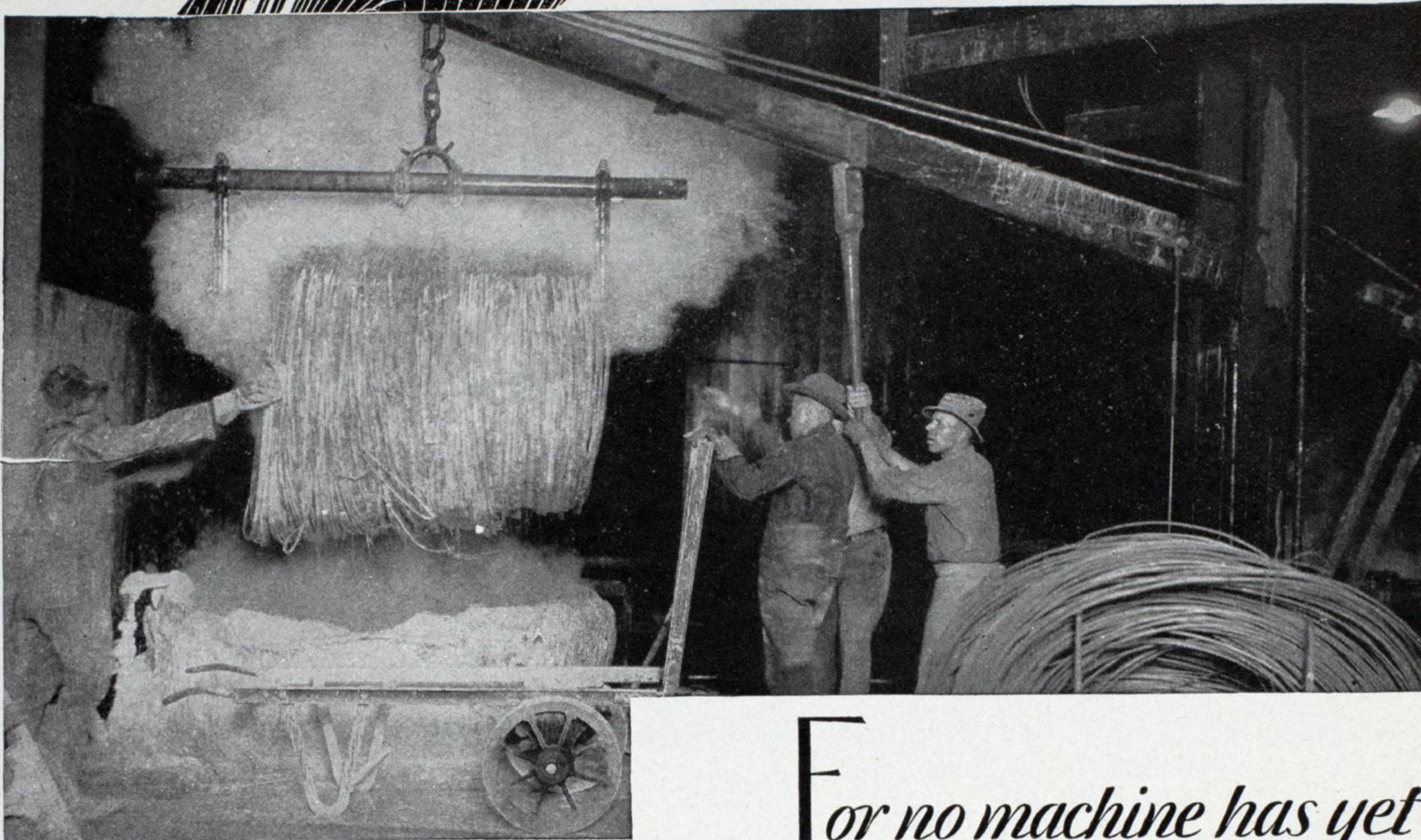
# Westinghouse

T 79142

*Quality workmanship guarantees every Westinghouse product*







*For no machine has yet  
been found to do the job as  
thoroughly!*

**T**HE cleaning of rods, that will become wire and later Wickwire Spencer Wire Rope, is far too important a process to employ other than the most thorough methods. While the Wickwire Spencer Rope plant is equipped with the most modern labor-saving machinery, there are several steps that still employ costly manual methods... operations that are better performed by hand. Here, quality of product has, does and always will take precedence over production economies.



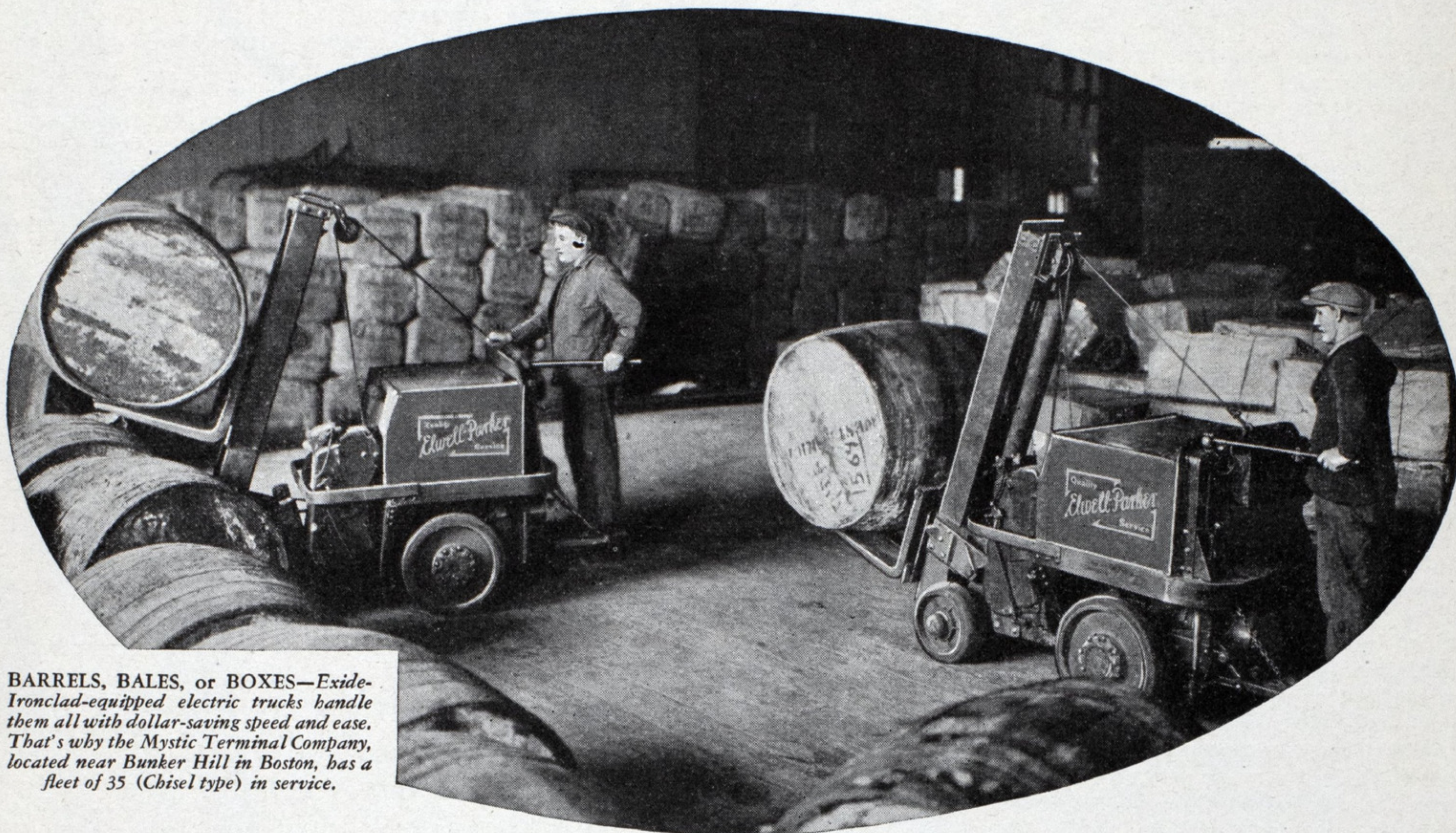
Wickwire Spencer Steel Company, 41 East 42nd Street, New York City  
Buffalo, Chicago, Detroit, Philadelphia, Worcester, Tulsa, 314 E. Archer Street. *Pacific Coast Headquarters*  
San Francisco. *Warehouses:* Los Angeles, Portland and Seattle. *Export Sales Dept.:* New York City.

**WIRE ROPE** Send for our book. It is free  
and will prove of great value  
*by Wickwire Spencer*





# PAID FOR THEMSELVES in 100 days!



BARRELS, BALES, or BOXES—Exide-Ironclad-equipped electric trucks handle them all with dollar-saving speed and ease. That's why the Mystic Terminal Company, located near Bunker Hill in Boston, has a fleet of 35 (Chisel type) in service.

## *Boston & Maine Railroad through its Mystic Terminal Company saves money, speeds operations, with fleet of 40 Exide-Ironclad-equipped electrics*

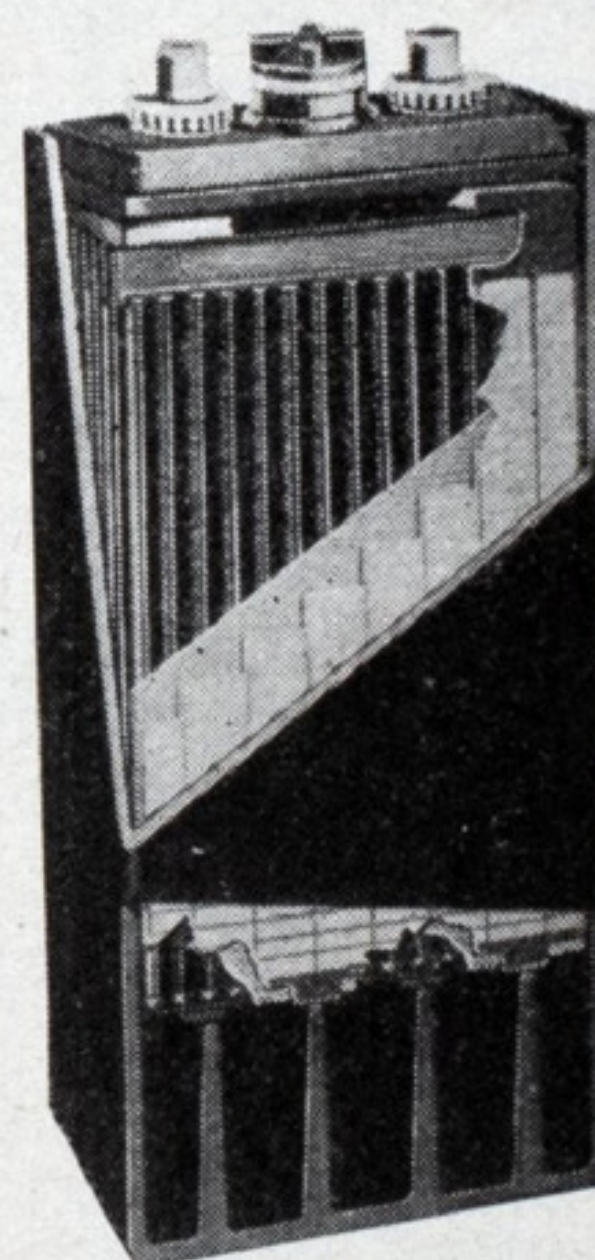
AS MANY as 13 deep-water vessels can be berthed and worked at the piers of the Mystic Terminal Company in Boston.

This cargo—it may be wood pulp from Sweden-Norway-Germany-Italy or the West Coast, China clay from England, cotton from Egypt, or pink granite from Sweden—must be handled in the shortest possible time with the least expense and labor.

An imposing fleet of 35 Chisel type electric trucks, powered by Exide-Ironclad Batteries, does the job. Expensive? Each truck fully paid for itself in actual savings after only 100 days of work!

Wherever material is to be handled with speed and ease, Exide-Ironclad-equipped electrics have proved the most economical transportation unit available. One reason is the battery itself. Exide-Ironclads have a decidedly different construction. Long life is built into each cell. They require very little attention and care, yet day after day they give steady, reliable service.

If you want to keep those maintenance figures down, send for our booklet, "The Adaptability of Electric Trucks and Tractors." Or discuss your handling problems with an Exide representative.



IT'S DIFFERENT—The construction of this Exide-Ironclad cell means longer life, lower costs.

# Exide

## IRONCLAD BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia  
THE WORLD'S LARGEST MANUFACTURERS OF STORAGE BATTERIES FOR EVERY PURPOSE

*Exide Batteries of Canada, Limited, Toronto*



# Quality at NEWPORT NEWS

NO job is good enough in the yards at NEWPORT NEWS as long as there is possibility of improvement.

Initiative and pride in workmanship are encouraged to the point where everyone contributing to the design and construction of ships BUILT AT NEWPORT NEWS follows with keen interest their performance for many years after they are completed.

NEWPORT NEWS has always built good ships.

It is the sincere endeavor of every member of a highly efficient and skilled organization to set the highest standards of design and workmanship—to give the client the best that can be produced with the aid of proper shipbuilding facilities and scientific scheduling methods—in short, to produce better ships.

"SHIPS OF CHARACTER"

Newport News Shipbuilding  
and Dry Dock Company

Newport News, Va.

90 Broad St., New York City





# FLOORS

**SELBALITH CUSHION COAT**  
to receive rubber or cork tile or linoleum

**SELBALITH HARD FINISH**  
for staterooms and service spaces

**SELBALITH TILE**  
for smoking rooms, passageways and lobbies

**GOODYEAR RUBBER TILE**  
the aristocrat of decorative floors

**TILETEX**  
asphalt tile plain and mottled colors  
**AND ELEVEN OTHER TYPES**  
including cork, vitreous and ceramic tiles

**SELBY, BATTERSBY & COMPANY**  
*Floorcrafters*

Philadelphia  
33d & Arch Sts.



New York City  
135 Liberty St.

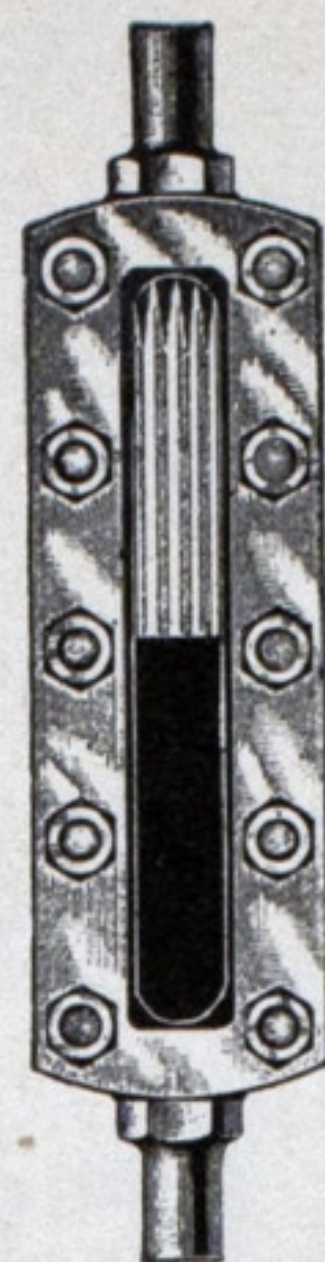
## PLAN NOW

The marine industry is of tremendous importance as a market for your products and service.

Marine Review can assist you in securing better sales returns. It is subscribed for by more steamship executives and ship operating officers than any other marine publication. Further, Marine Review gives you complete coverage of the shipyards as virtually every one of them subscribe for one or more copies.

*Be sure to include Marine Review in your sales and advertising plans to reach the really important men who say yes, and O. K. requisitions in the marine trade.*

## REFLEX WATER GAGES



Used on all types of boilers by all the Principal Navies of the world

**"The Water Shows Black"**

**ADVANTAGES:** Quick and reliable observation of the water level. Safe, sure and durable at high pressure. Not affected by cold air drafts. Most effective protection against injuries to boilers and workmen. Easily applied to all types of gage glass fittings.

When filled with WATER the Reflex Gage always appears **BLACK**. When empty it instantly shows **WHITE**. No mistake possible. This feature alone is worth many times the cost of the Reflex.

Send for catalog of Water Gage Apparatus

MANUFACTURED BY THE  
**JERGUSON**  
**GAGE & VALVE CO.**  
WINTER HILL, SOMERVILLE, MASS.



**Propeller** **Wheels**  
and **Blades**

*to fit any hub.*

**Sheriffs Manufacturing Co.**  
*Established 1854*  
Milwaukee, Wis.

*Something Different*

**.. BRAND NEW STABILIZER ..**  
**FULLY EQUIPPED**

**ACORN IRON and METAL COMPANY**

Tennessee and Mediterranean Aves.

**ATLANTIC CITY, NEW JERSEY**

## Classified Advertisements

**FOR SALE**

**TUG "JOHN E. MEYER"**

All steel construction, 108' long, 24' beam, 14½' molded depth, 650 H.P. triple expansion engine 15½" x 26" x 44" x 26" stroke. Scotch Marine Boiler, 180 pounds working pressure.

**DERRICK SCOW "AMERICA"**

Heavy wood hull, 180' long, 48' beam, 14½' deep, 1800 ton capacity, 25 ton derrick forward and 18 ton derrick aft. Derricks stiff leg swing circle type, equipped with 3 yard and 2 yard clams.

Entire outfit in excellent operating condition. May be inspected at Superior, Wisconsin.

Complete details furnished on request.

The Barnett & Record Company  
700 Flour Exchange  
Minneapolis, Minn.

**FOR SALE—STEEL STEAM TUG 80' x 22' x 12'—600 H.P. ALSO** wooded hull steam tug, oil burner, 80' x 20' x 10'—400 H.P. Prices very reasonable. Address Box 428, MARINE REVIEW, Penton Bldg., Cleveland, Ohio.

**FOR SALE AT A BARGAIN. COOPER-BESSEMER 6 CYLINDER** 125 H.P. full diesel engine. This engine has been used very little and is in splendid condition. Address Box 429, MARINE REVIEW, Penton Bldg., Cleveland, Ohio.





## TAKE A LAKE ERIE HOLIDAY

**ONLY \$3.75 ONE WAY  
between CLEVELAND and BUFFALO**

Autos, any size, carried for only \$3.75  
(\$4.75 July 1st to Sept. 14th inc.)

**Why drive when you can put your car  
aboard for less than the cost of oil and gas?  
More restful . . . cheaper . . . and saves a day.**

*Steamers each way, every night, leaving  
at 9:00 P. M., May 15th to November 1st*

**CLEVELAND AND PT. STANLEY, CANADA, DIVISION**  
July 1st to September 5th inclusive on Friday, Satur-  
day and Sunday only . . . \$3.00 one way; \$5.00 round  
trip. Any car only \$3.75.

*Ask your Local Tourist or Ticket  
Agent for new C&B Line Folder,  
including Free Auto Map and  
details on our All Expense Trips.*

**The Cleveland and Buffalo  
Transit Company**

E. 9th St. Pier

Cleveland, Ohio



## SAMSON SPOT Log Lines

Smooth, tough and durable; no adulterating material to stiffen it and decrease strength and durability. Solid braided of extra quality cotton yarn. Uniform in size and quality. Easily identified by the colored spots, our trade mark.

We also manufacture flag halyards, lead lines, tiller rope; solid braided cotton cord in all sizes for various marine uses. Ask for catalog and samples.



*Trade Mark  
Reg. U.S.  
Pat. Off.*



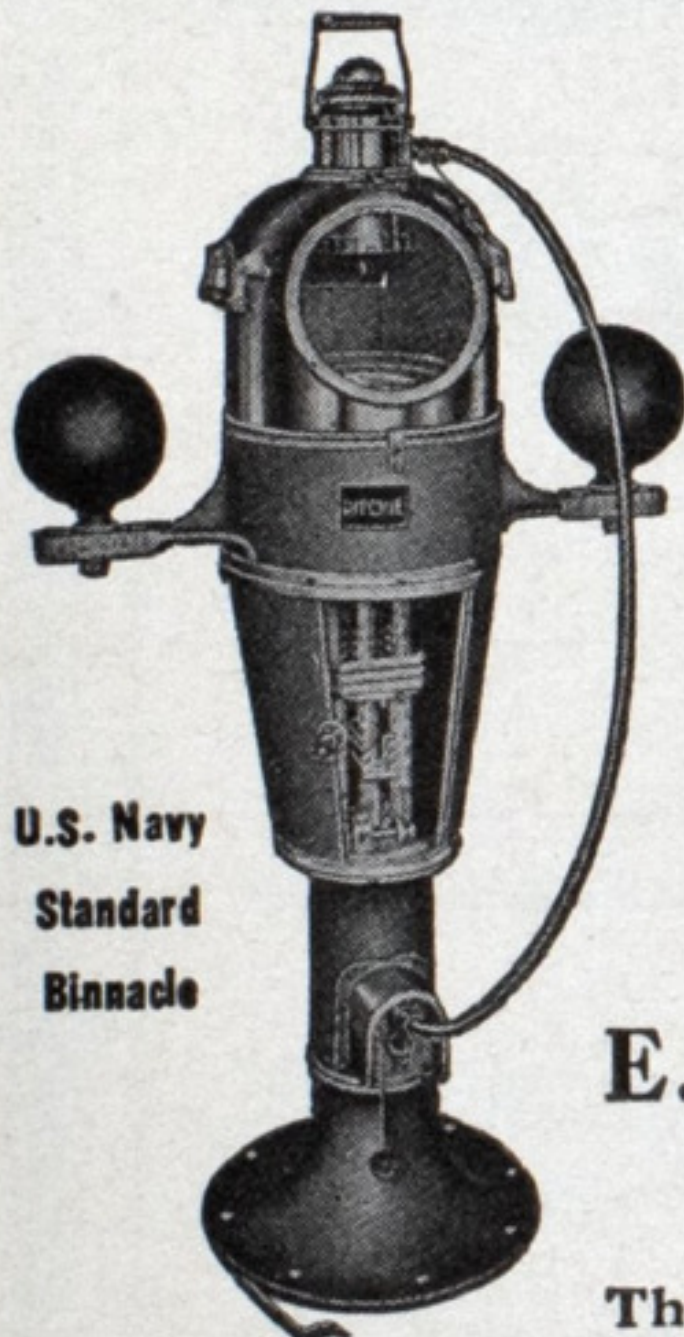
**SAMSON CORDAGE WORKS**

89 BROAD STREET

BOSTON, MASS.



## THE RITCHIE LIQUID COMPASS



U.S. Navy  
Standard  
Binnacle

The Standard Liquid Compass the world over.

Used Exclusively in U. S. Navy for over 40 years.

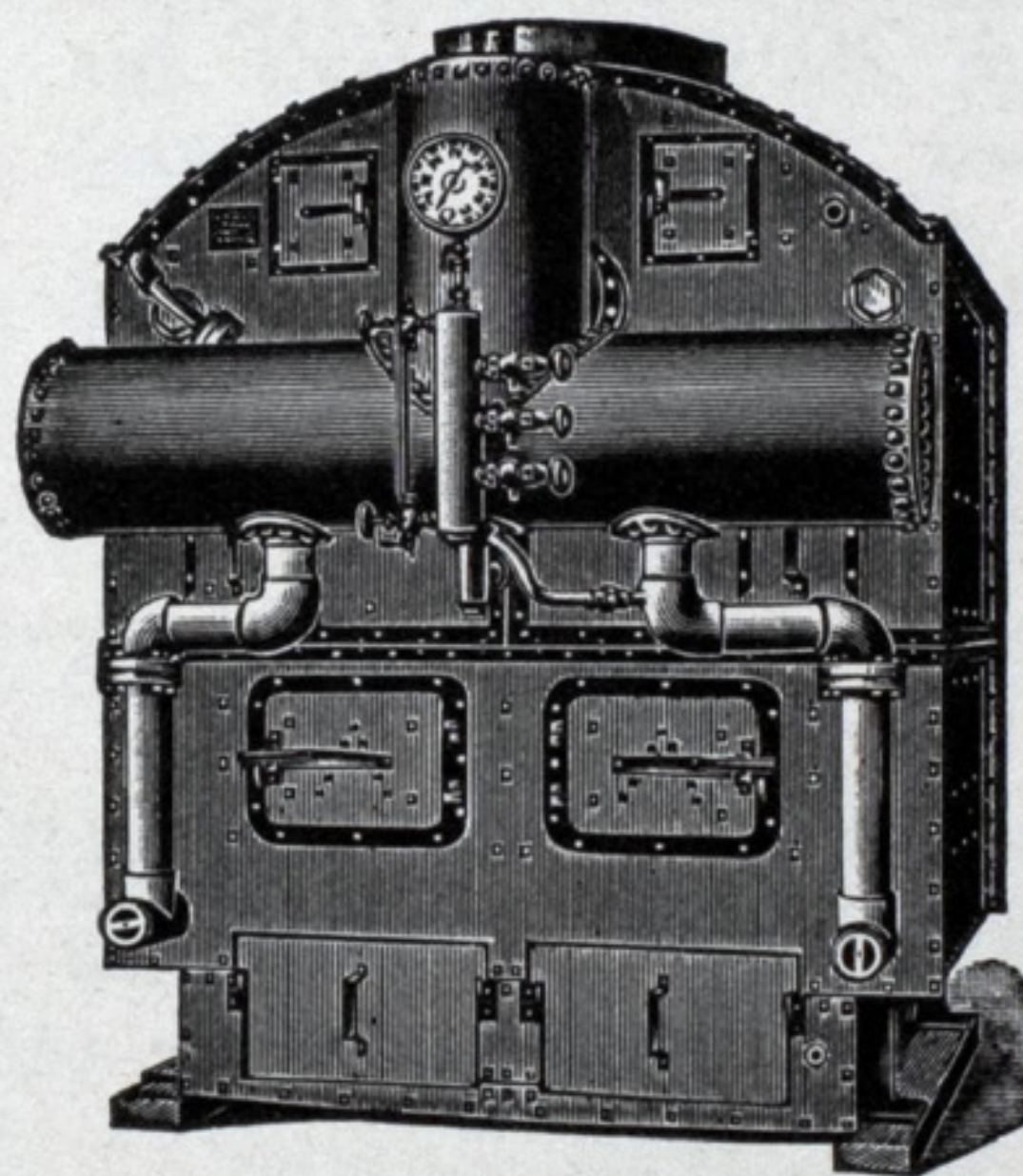
Over 65,000 on Merchant Vessels in all parts of the world.

Made in all sizes 2 to 12" dia.

Magnets for adjusting Purposes.

**E. S. RITCHIE & SONS**  
Brookline, Mass., U. S. A.

*Agents for the Great Lakes,  
The Upson-Walton Company, Cleveland, Ohio*



**Almy Water Tube  
Boiler Co.**

Builders of  
Sectional Water  
Tube Boilers  
for all types of  
vessels

**Providence, R. I.  
U. S. A.**

CATALOGUE FREE

## MANITOWOC SHIPBUILDING CORPORATION

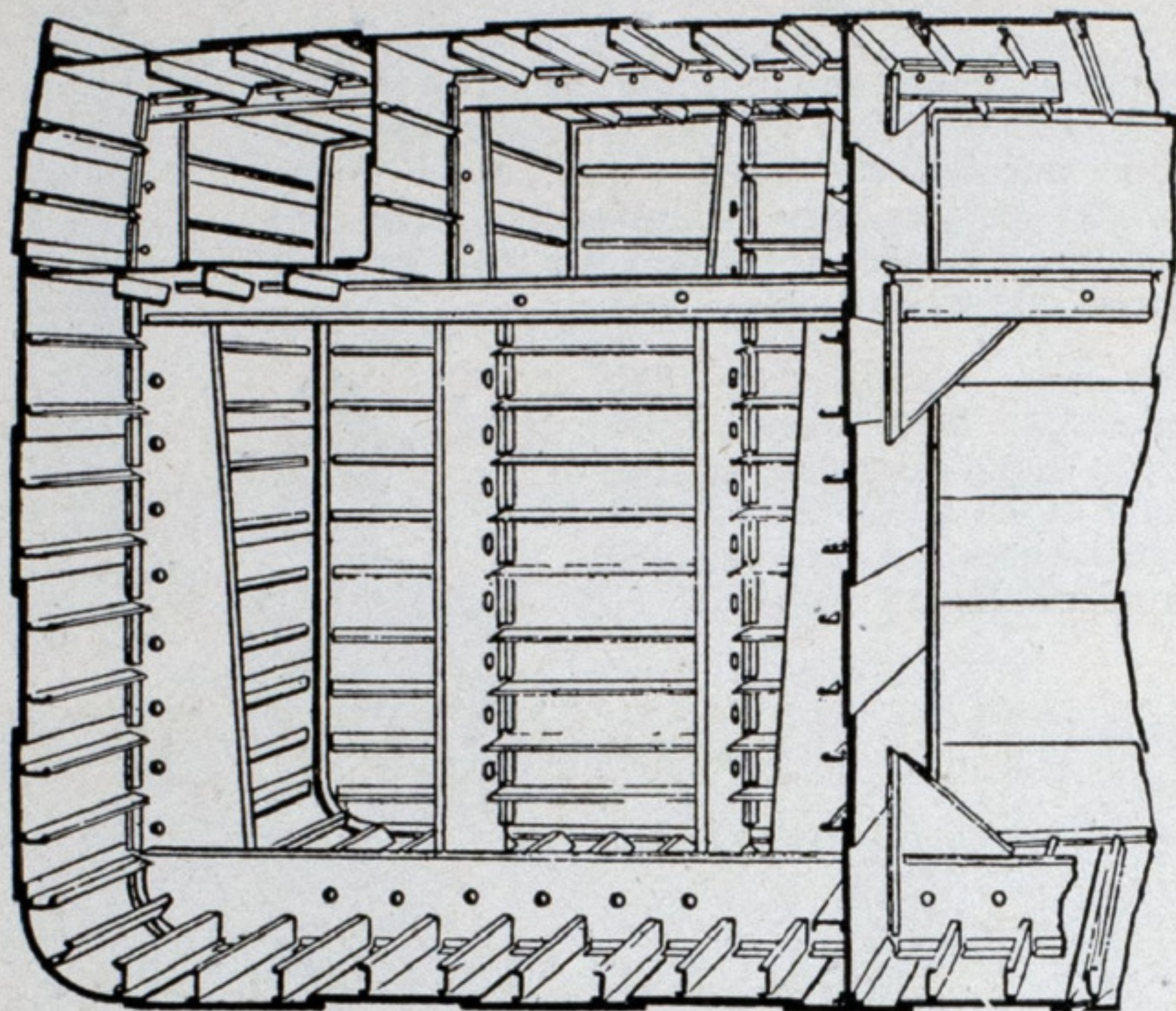
Designers and builders of steel passenger and freight vessels, oil tankers, carferries, self unloaders, sand suckers, yachts, dredges, derricks, barges, scows, fire boats, lighters, tugs, marine engines, marine boilers, etc.

Excellent dry docking facilities for quick and economical repairs.

**MANITOWOC, WISCONSIN**



**Progress in Oil-Tank Ship Construction**  
**The "Bracketless-System"**  
(PATENT)



Eliminates Bulkhead Brackets  
Eliminates Bulkhead Leakage  
Greatly Simplifies Construction  
Greatly Reduces Cost of Damage Repairs  
Greatly Reduces Cost of Cleaning Tanks  
Substantially Increases the Longitudinal Strength  
Beyond the Well-tried "Isherwood System"

Shipowners are advised to specify that plans and structural arrangements should be approved by

**SIR JOSEPH W. ISHERWOOD & CO., Ltd.**

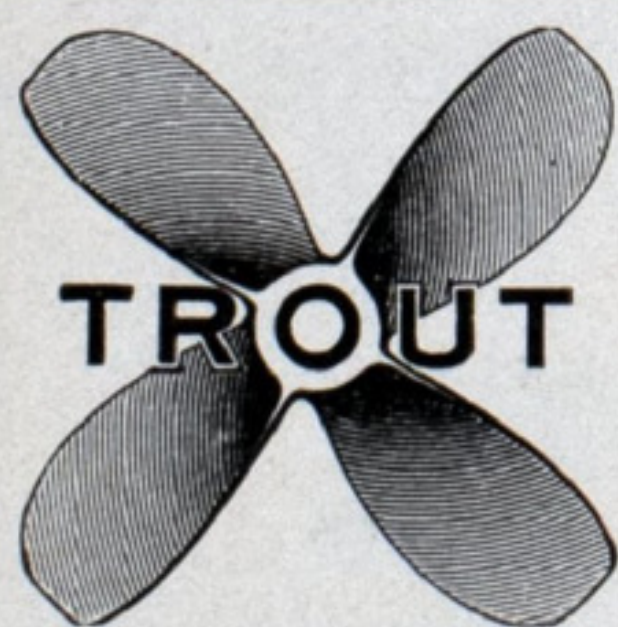
17 BATTERY PLACE, NEW YORK  
and 4, LLOYD'S AVENUE, LONDON, E. C. 3

1



**ANDREW J. MORSE & SON, Inc.**  
221 High Street BOSTON, MASS.  
Established 1837

Diving Apparatus and Submarine Armor  
Fire Protection Equipment  
The Invincible Nozzle  
Catalogues on request



**E. H. READING**  
**PROPELLER WHEELS**  
Machinery Repairs  
226 Ohio St.  
**BUFFALO, N. Y.**  
'Phone Washington 5361



**HAMBURG-AMERICAN**  
**LINE**

**Passenger Services:** New York to Cherbourg, Southampton and Hamburg. New York to Galway, Cobh (Queenstown), Cherbourg and Hamburg. North Pacific Ports to Hamburg, Bremen and Antwerp via Panama Canal.

**Pleasure Cruises:** Around the world, to the West Indies, to Northern Wonderlands.

**Freight Services:** New York to Hamburg (8 days). Boston, Philadelphia, Baltimore and Norfolk to Bremen and Hamburg.

North Pacific Ports direct to Hamburg, Bremen and Antwerp.

**HAMBURG-AMERICAN LINE**

39 Broadway

New York

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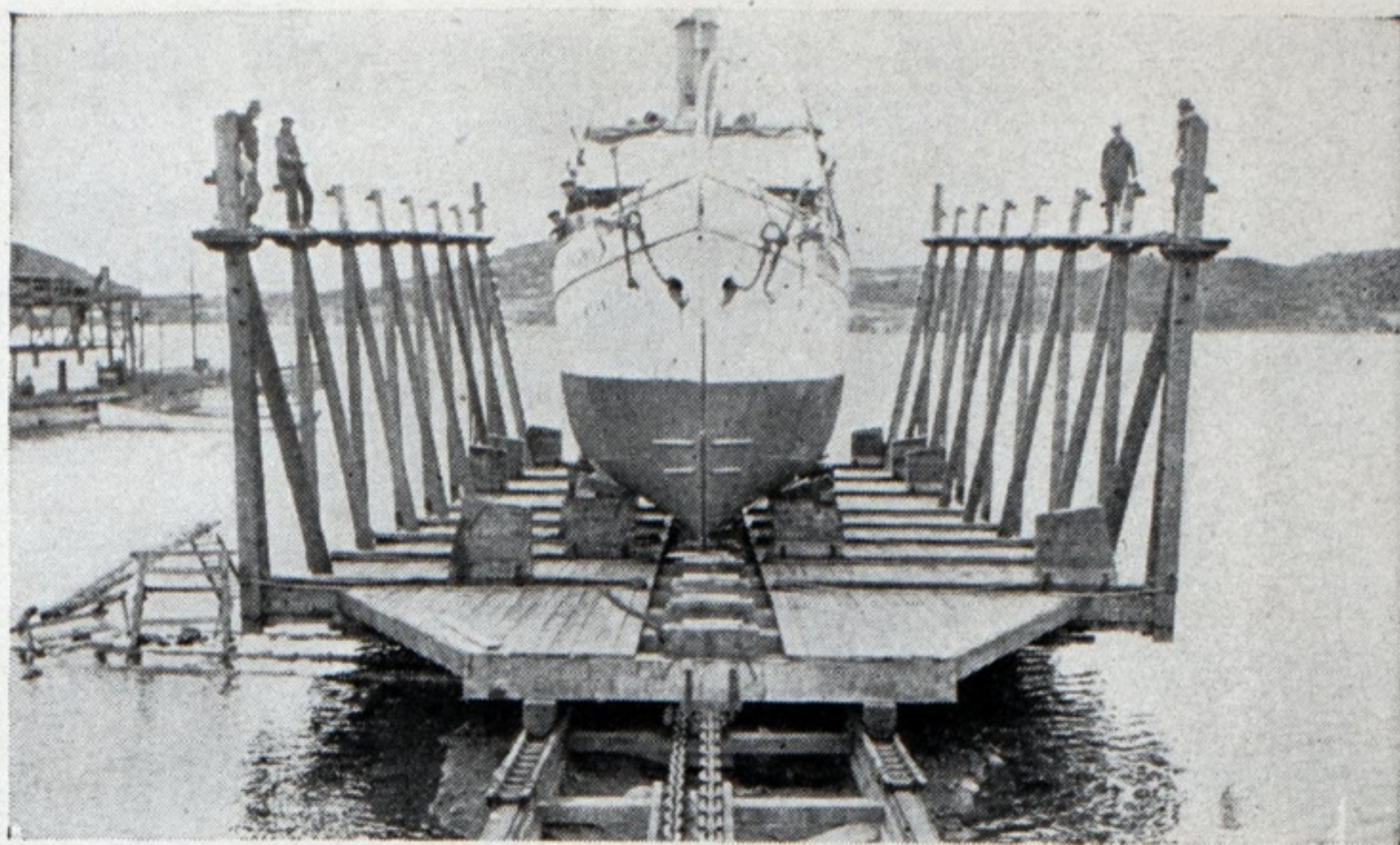
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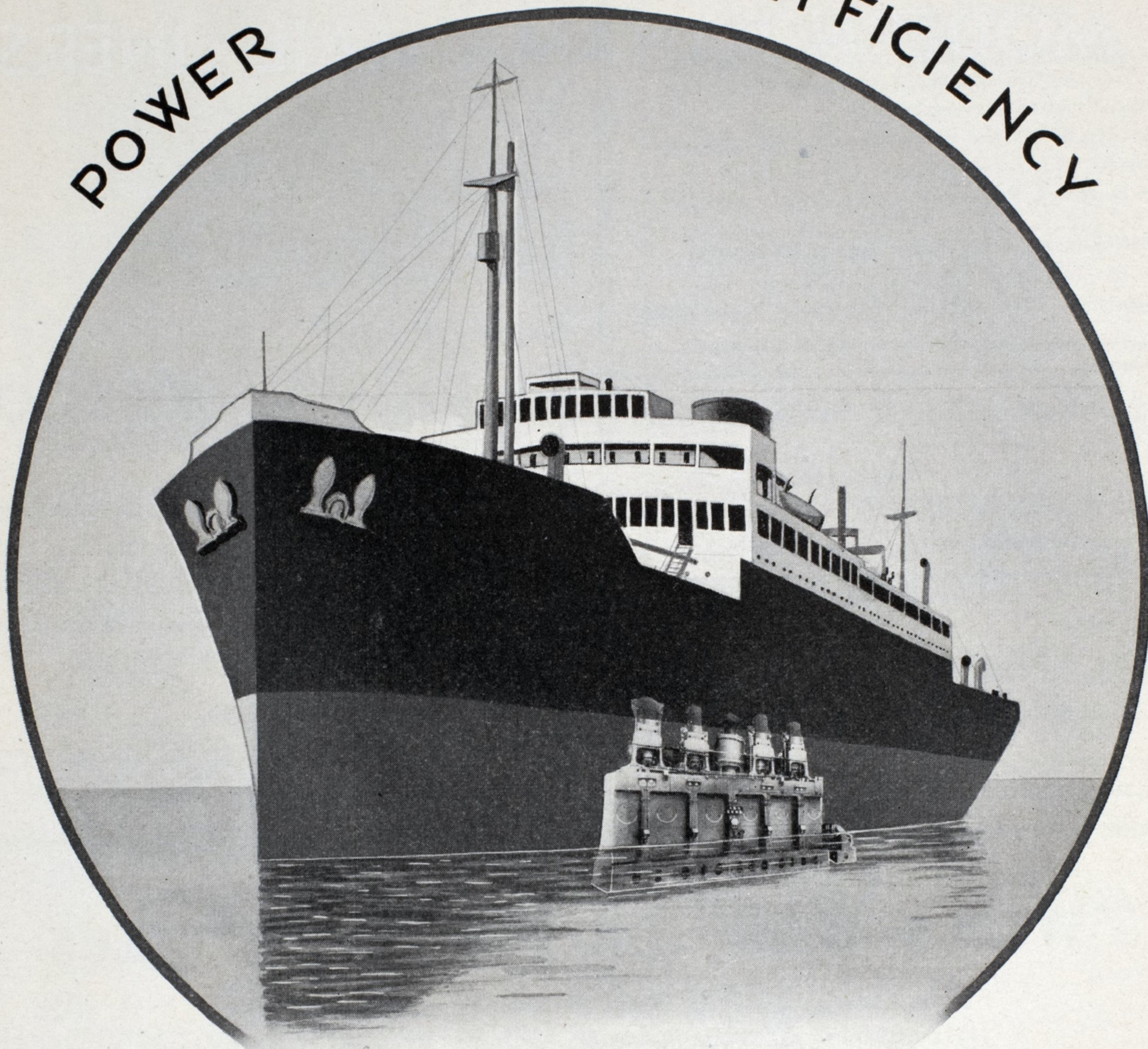
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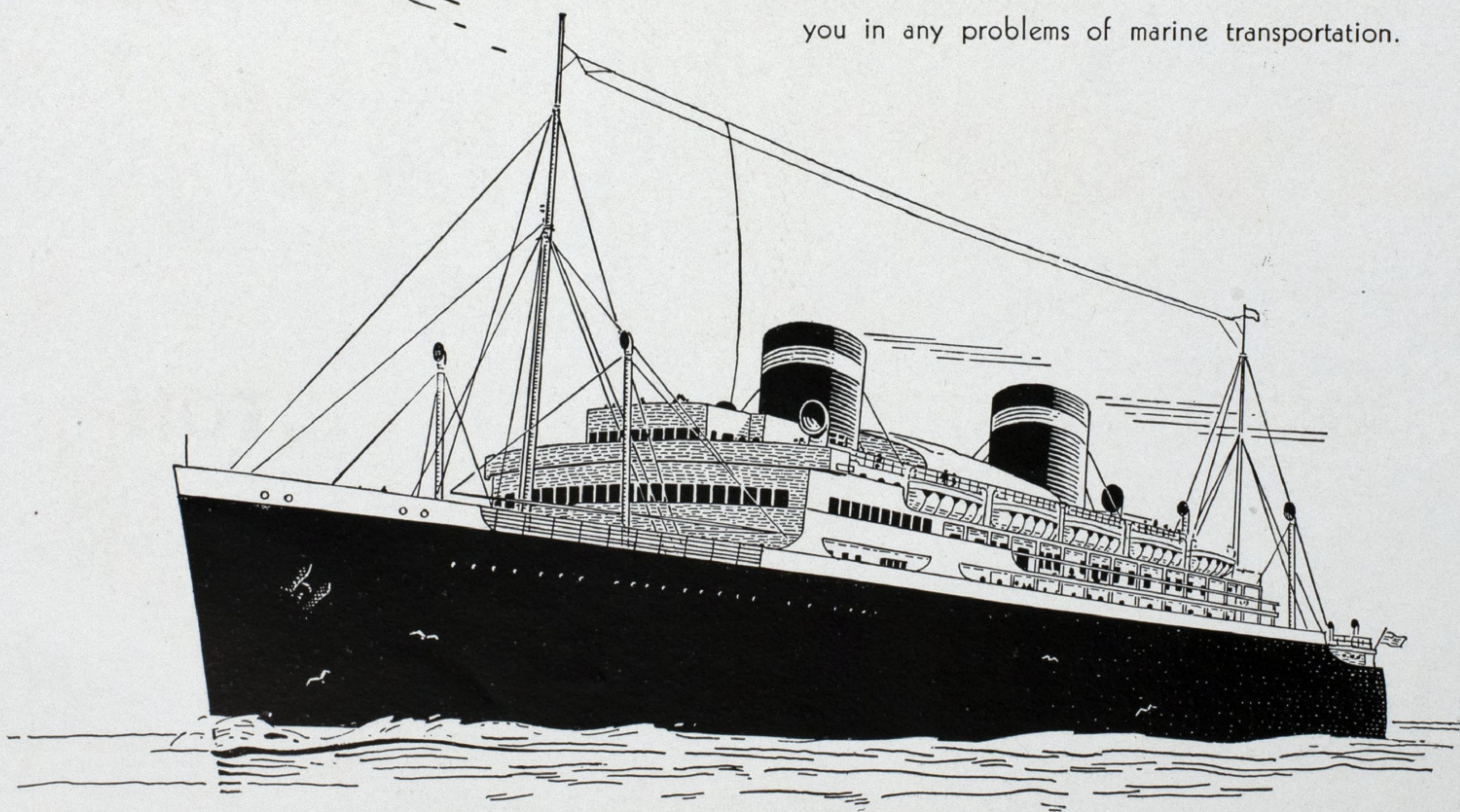


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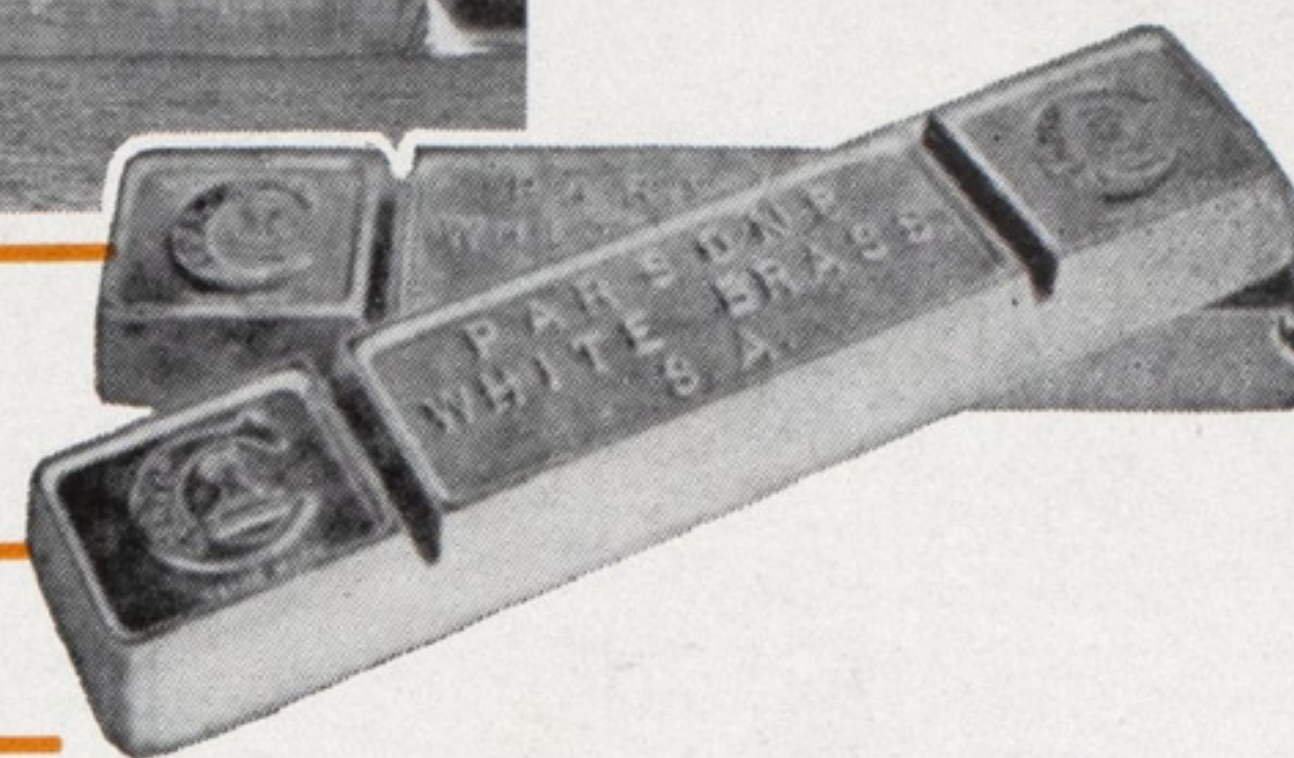


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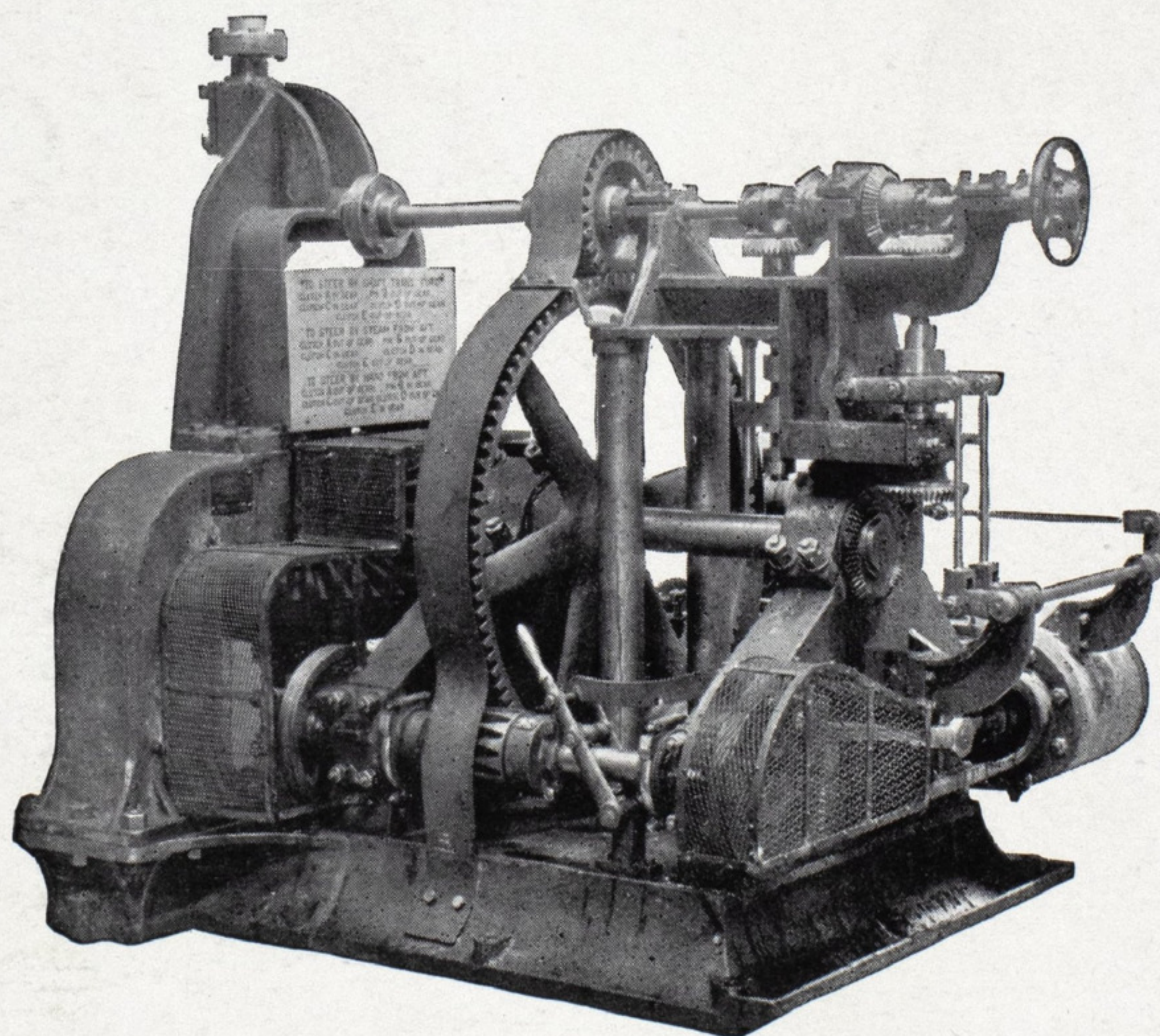
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